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DERMATITIS

CHAIRMAN'S ADDRESS

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BOSTON

At the turn of the century allergy was an unknown word. It was coined by Pirquet in 1906 to express the concept of an altered capacity to react, in an attempt to simplify the problems of "hyposensitivity and hypersensitivity." Perhaps time will justify its choice, but at present the term needs further clarification. Hence many immunologists and practitioners still prefer such terms as sensitivity, hypersensitivity, hyposensitivity, anaphylaxis and idiosyncrasy. Whatever the fate of the word allergy may be, or the concepts which prompted the origin of the term, it has profoundly stimulated thought, blazed new trails into the hinterlands of research and forged bonds of common interest between dermatology and other branches of medicine, particularly immunology.

Under this influence dermatology has made striking progress in the past four decades. Of special note is our growing knowledge of those groups of so-called eczemas which comprise perhaps three fourths of all cutaneous disease. For a long time the majority held that such disturbances were nutritional in origin. Jadassohn and his school, however, refused to accept this metabolic theory and maintained that most eczemas were caused by external factors. As a result, much has been done to solve the riddle, so much that it would be impossible to give adequate credit to any one individual or group of individuals without slighting some one who also has made a valuable contribution to the solution of the problem of dermatitis and eczema. Therefore, names and references to particular studies will be omitted in this paper, with the understanding that I make no claim for originality but am merely presenting a summary and my opinions based on the recent work for which dermatology owes a debt of gratitude. Investigative research has narrowed the concept of eczema. Narrow as this concept may be, there still remains a group which cannot be explained by external influences.

There have been attempts to eliminate eczema from the medical vocabulary, but like rheumatism it seems entrenched as a household word. To the lay mind it is an awesome and treatment-resistant disease of the skin; to the practitioner it is a convenient label for an itching cutaneous eruption of doubtful origin, while to the dermatologist it is a symptom complex which at some time in its course is characterized by vesiculation and oozing.

The term eczema may disappear when the causes of all cases are better understood, but it cannot be ignored today. In any case, disagreements over the endogenous or exogenous origin of the disease are of minor importance; the important factor is the research which is simplifying the maze of descriptive morphology by eliminating those cases for which a specific etiology has been found. The essential problem is our understanding of the concepts of specific, altered reactivity or cutaneous hypersensitivity; that eczema, so called, is an abnormal reaction to a normally innocuous exposure and that the person so afflicted has some predisposing change in his system that needs readjustment. By keeping these distinctions clearly in mind, we may be able to control our concepts of allergy and eczema and not let them embrace practically all cutaneous disorders as eczema once did.

Every eczema is a dermatitis but the converse is not true. Dermatitis, a much broader term, is an inflammation of the skin due to internal or external causes, the result of contact, ingestion, inhalation, injection, instillation or other methods of absorption. It is characterized by erythema, edema, papules and vesicles; it may progress to simple scaling and desquamation or it may first become oozing and crusted and then desquamate; it may become secondarily infected with the formation of pustules or persist as an infiltrated, excoriated, lichenified eruption rebellious to treatment. Clinically it may present any one or any combination of the lesions mentioned. Confusion has arisen from the use of the terms eczema and dermatitis as if they were distinct entities. This has been further increased by qualifying the terms according to morphology, topography, etiology and predisposing factors.

DERMATITIS DUE TO EXTERNAL CAUSES

Dermatitis due to external causes (dermatitis venenata) is so common that it requires classification. This classification considers first the type of agent, second the use of that agent and third the nature of the lesions produced. The second division of that classification is of little value because the agent may be employed under continually changing conditions, as for example paraphenylenediamine, which is extensively used in the manufacture of cosmetics, textiles, garments and other branches of industry. The third division is also open to criticism because the same contact may produce varying degrees of disease, depending on its strength as applied, the area to which it is applied and the method of application; that is, friction and the time exposure. As an example I might cite those oils which cause folliculitis of the arms or cancer of the scrotum.

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Because of lack of space this article has been abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

Read before the Section on Dermatology and Syphilology at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

The classification most scientifically accurate is based on the etiologic factor which groups irritants somewhat as in table 1.

In general the concentration of the irritant, the length of time and the conditions under which exposure occurs

Fig. 1.—Dermatitis factitia, July 10, 1934: P. N., a man aged 50, cut the right third finger Sept. 9, 1933. The excrescences resembling dark brown tortoise shell appeared on both hands. Plaster casts ended the lesions and the compensation he was receiving. He was again seen Feb. 13, 1937, when he had an assumed name, similar lesions and compensation from another insurer since April 2, 1936. Casts were not necessary this time; he settled his claim promptly.

serve to differentiate two types of dermatitis venenata —nonsensitization and sensitization. Just where the former ends and the latter begins is often impossible to say. Nonsensitization dermatitis is caused by an irritant that will in given concentrations and under given surrounding factors, such as sealing of the exposed area, affect practically all human skins. Following the repair of such an injury the minutest exposure may suffice to produce a recurrence. Nonsensitization dermatitis is caused by some mechanical or physical agent or by a powerful chemical applied either deliberately or accidentally to the skin. The reaction is sudden and explosive. It is characterized by all degrees of inflammation and at times by the destruction of the cutaneous layers and even the subjacent tissues. The causative factor is almost always recognized and known to the patient; hence recovery is fairly prompt. Conspicuous in this group are the bizarre and unnatural eruptions called dermatitis factitia (fig. 1), which are self inflicted to invoke sympathy, escape unpleasant duties or obtain remuneration. They must be considered in the differential diagnoses of industrial dermatoses.

ECZEMA

Sensitization dermatitis, variously known as eczema, contact dermatitis or contact eczema, allergic dermatitis or allergic eczema, is an inflammation of the skin due to repeated exposures to substances which are normally innocuous (fig. 2). In this type there is an initial exposure without resulting lesions, but subsequent exposures to even minimal quantities may result in reactions manifested either at the local site of contact or as a generalized process (fig. 3). The disease may be specific or nonspecific and is usually acquired in extra-uterine life.

In occupational eczema this hypersensitivity is obviously so acquired. A review of my last 500 cases showed only one with a positive family history; thirty-three, or 6.6 per cent, showed a previous history of cutaneous eruptions, and of these thirteen, or 2.69 per cent, had been classified as industrial. The development of occupational eczema is usually so gradual that it is

TABLE 1.—*Classification of Irritants*

A. Mechanical or physical agents	
1. Heat or cold; dermatitis caloria	
2. Radium and x-rays; radiodermatitis	
Ultraviolet ray; dermatitis actinica	
3. Mechanical irritation (friction, pricks, cuts); dermatitis traumatica	
4. Mechanical interference with bodily functions (oils or powders); folliculitis	
B. Flowering plants and their products—woods, extracts, lacquers; rhus dermatitis	
C. Living agents—fungal flora; dermatophytosis, members of the animal kingdom, mites; dermatitis parasitica	
D. Chemical agents, organic or inorganic; dermatitis industrialis or cosmetica	

difficult to determine when it really began. A sudden onset is rare except when the person has been in contact with a substance for years, followed by a period in which there was no exposure, after which renewed exposure reveals a sudden and severe sensitization. In the typical onset the experienced observer may trace a characteristic development. The areas first affected are those of maximum contact and the initial lesions offer valuable clues. Such lesions occur frequently among seasoned workers. Hence the causative factor is difficult to determine because of the long incubation period (fig. 4). Many occupational dermatitides are true

Fig. 3.—Dermatitis due to adhesive plaster, Oct. 6, 1939, seen on M. C., a woman aged 55. Local and generalized sensitization manifested after strapping of right lower leg.

examples of hypersensitivities. The diagnosis of a sensitization dermatitis is usually obvious to the trained dermatologist; nevertheless a thorough physical examination accompanied by laboratory studies should be made to confirm the diagnosis and determine the predisposing factors.

HISTORY TAKING

History taking is most important, especially with reference to the time of onset. A careful survey should also be made of the family and personal history in an effort to establish hay fever, eczema, asthma or other manifestations of a family tendency toward hypersensitivities. The patient may state that the eruption has continued for years, while analysis discloses that the attacks are periodic and perhaps seasonal.

In industrial work such a history is most important and its accuracy must be clearly established. Length of service may assist in evaluating the truth of the evidence. The precise time of occurrence is especially significant. An eruption appearing immediately after a vacation would suggest a nonindustrial exposure or an explosive reaction of previously formed hypersensitivity. An eruption appearing at the beginning of a day's work may suggest predisposing home factors such as illness, worry, lack of sleep or dissipation. A similar disturbance at the end of a day's work may indicate excessive fatigue, carelessness or failure to use preventive measures. The introduction of a new chemical should be investigated, as well as the use of sensitizing drugs in the treatment of trivial injuries. From an economic point of view the time of onset may determine which insurer is liable for a disabling dermatitis. Other factors to be considered are a change of domicile, animal pets, plants, new furniture, the use of cleaners or insecticides in the home and recently purchased articles for personal adornment. The history should disclose a picture of the patient's routine and contacts at home, during recreation and at work. A comparison with other members of the family or employees may reveal significant details; otherwise a visit to the home or place of business may be necessary. Such a history will narrow the field of possible irritants and avoid needless cutaneous testing and the invoking of phobias. The history should suggest the cutaneous tests necessary to determine the etiology.

A specific sensitization can usually be discovered, but polysensitization greatly multiplies the difficulties; in a search of the causes of such eczematous dermatitides scratch and passive transfer tests are valueless; patch tests should be employed. A knowledge of closely allied chemicals and the existence of the same chemical in various contacts, in various medicaments and in foods is essential. As an example I might cite iodine in mangoes, cashew nuts and the iodides. The discovery of the etiologic factor and the instructions on its avoidance are the best methods of preventing recurrence.

PROGNOSIS

Prognosis, always important, is especially so with the industrial worker. Here hypersensitivity may be the controlling factor. If this condition is permanent the indisposition will continue. But there are undoubtedly many cases that are aggravated by predisposing factors such as overexposure, carelessness, fatigue, contact with other sensitizers, illness and dissipation. When these factors are removed the hypersensitivity disappears and the patient gets well. A sensitivity may persist although adjusted, but a certain percentage of such sufferers can return to work and remain well. To illustrate:

G. K., a man aged 39, worked for years without a vacation at servicing toilets. He handled a disinfectant containing oil of wintergreen, oil of pine, chlorine and phenol. During his vacation he did odd jobs which involved the use of turpentine and gasoline and on the two last days of his vacation he suffered an eruption on the fingers of his right hand. This eruption spread rapidly within forty-eight hours after he resumed his regular employment. Drops of turpentine, gasoline and the disinfectant were applied to three areas of the intact skin, blotted and left uncovered. An immediate reaction to the turpenine persisted for twenty-four hours. A few moments later redness was disclosed at the site of the gasoline test; this lasted for six hours. Within a half hour marked erythema appeared at the site of the disinfectant; within twenty-four hours this area assumed the characteristics of his dermatitis and lasted for three weeks.

A thousand questionnaires were recently mailed to workers who had suffered from occupational dermatitis and been discharged as cured more than three years

Fig. 4.—Dermatitis due to nickel, July 16, 1938, seen on E. W., a woman aged 26, a garter maker. Sensitivity to her own garters was manifested on the thighs, later on the hands and forearms, as a result of handling nickel fasteners.

before. The difficulty of conducting a follow-up investigation and the migratory propensities of the lower paid workers were graphically revealed when no fewer than 213 questionnaires were returned because the addressee was unknown or had no address. Replies were obtained from 212 persons, of whom 204 had returned to their occupations. One hundred and four, including eight who never attempted to return to their occupations, suffered no further skin trouble. One hundred and twenty-five were able to remain at their occupations, fifty-five suffering occasional attacks and twelve having continued outbreaks lasting from three to nine years. Eight of these ailing ones were afflicted rather continuously, while in two instances the condition was aggravated by winter and in two by summer weather. If it may be assumed that the 204 replies represent a fair and adequate cross section of the experience, age, physical condition and the like of the 1,000 who were interrogated regarding their experience with dermatitis, it would appear that the average person has almost a

fifty fifty chance of not having a recurrence of his dermatitis if he continues in his same occupation and under the same conditions. However, this assumption may not be a fair one without an analysis of the various exposures of industry. An analysis of the 204 replies with respect to length of service in their present occupation and in relation to the probability of recurrence of their cutaneous disorder revealed a tendency for persons with short periods of service (and thus short periods of exposure) to have proportionately fewer recurrences than those with the comparatively long periods of service. Table 2 may illustrate this point more clearly.

Of those persons having one year of service or less only 13 per cent had recurrences, as compared with 25 per cent who did not. Furthermore, of those having comparatively long periods of service (five years or more) almost one and one-half times as many had recurrences (53 per cent) as did not (36 per cent). Thus it would appear that length of service (length of exposure) has some bearing on the probability of recurrence of a contact dermatitis. To translate these results into the probabilities of having or not having recurrences of a dermatitis would appear roughly as follows:

Fig. 5.—Dermatitis due to strong alkalis, Aug. 29, 1933, seen on G. W. R., a man aged 35, a cloth dyer. Eruption due to caustic soda.

1. The chances of the average person who has contracted a dermatitis of having a recurrence, provided he continues at his same occupation and under the same conditions, appear to be about fifty fifty, with the edge slightly in favor of his suffering a recurrence.

2. The chances for recurrence in a person with a comparatively short period of service (short period of exposure), say of one year or less service, appear to be about thirty-five in a hundred.

3. The chances for recurrence in a person with a comparatively long period of service (long period of exposure), say of five years or more service, appear to be about sixty in a hundred.

The apparent tendency for a person to have recurrences dependent on his length of service suggests that sensitization rather than desensitization results from continued industrial exposure. Failure to show clinical symptoms does not suggest immunity or toughening as much as ability to maintain the threshold of resistance. In fact I believe that, if any industrial group exposed to possible sensitizers is compared with a group not so exposed, skin test reactions would be more numerous among the former group even though they showed no symptoms of disease. The length of service in these cases does not lend support to preemployment patch tests, for ninety-two (90 per cent) of the workers had been employed for from one to twenty years before they showed their first symptoms of dermatitis. In this group of replies no dishwasher or other sufferer from prolonged contact with soap and water returned a questionnaire showing a recurrence. This may be due to the ignorance of this type of worker, but it is unlikely that alkalis (fig. 5) cause a persistent hypersensitivity. The duration of dermatitis from external causes depends on whether it is a nonsensitization or a sensitization eruption. The initial treatment may be a determining factor in either case. However, the former is self limiting, lasting in some instances but a few days and rarely three weeks or more. The latter, when uncomplicated, usually responds to treatment within three months, but unforeseen and unaccountable exacerbations frequently occur. Both may be prolonged by secondary bacterial infection, usually a combination of staphylococci and streptococci.

THE QUESTION OF SECONDARY INFECTIONS

Industrial accident board hearings frequently evoke the statement that mycotic infection has caused the persistence of the dermatitis. Direct microscopic or cultural proof, however, is rarely presented. Two separate investigations for mycotic infections of contact cases that had persisted for more than three months brought out the following results:

At our clinic, where scrapings of the hands and feet of 215 persons with the diagnosis of contact dermatoses were examined by a technician trained in myocologic work, there were 208 negative and only seven (3.3 per cent) positive pathogens, one a trichophyton, and six monilia, only two of which were decided to be Monilia albicans. There were numerous molds, yeastlike organisms and bacteria.

In my own office ninety-one cases of occupational dermatitis of the hands which had persisted for three months or more were examined by a mycologist. Scrapings from the hands, feet and other areas of the skin showed, on direct microscopic examination, four positive fungi, three from the feet and one from the hand, while five disclosed mosaic forms. Cultures produced five pathogenic fungi, two trichophytons and two Monilia albicans from tissues obtained from the feet and one Monilia albicans from the hands. Seventy-six cultures yielded saprophytic fungi of mixed character, while seventy-four yielded bacteria. Eight produced no growth whatever.

The analysis thus disclosed about 1 per cent positive mycotic infection in contact dermatoses. Such figures make an interesting comparison with a similar analysis of persons with apparently normal skin. In 100 such examples in which several areas of skin were scraped and examined, only two were pathogenic, an epidermophyton and a tricophyton, both isolated from the toes. Analyzing these cases, we are justified in drawing the conclusion that a person suffering from a contact dermatitis is no more subject to mycotic infection than one with normal skin. It is my own belief that, when complications arise, the involving organisms are bacterial.

TREATMENT

Treatment depends on whether or not one is dealing with a sensitization dermatitis. The nonsensitive form responds quickly to soothing pastes and lotions. The other type, particularly when prolonged exposure has

occurred, shows a skin so hypersensitive that it reacts unfavorably to medication with pastes or ointments, particularly when they contain mercury, phenol or menthol. Exacerbations arise from environmental exposure. Removing the patient from such exposures by hospitalization and the application of the simplest therapeutic measures such as wet dressings of boric acid or physiologic solution of sodium chloride hasten recovery. As these dressings must be kept continually wet, however, an impossibility in a large hospital, a small private hospital is preferred. Later treatment may include a bland lotion followed by a powder or a stiff paste. This paste should never be applied directly to the skin but should be placed on linen. Too vigorous removal of these applications will delay healing. When there is no apparent bacterial infection it is preferable to leave the lotion or paste on the skin or to sponge it off gently with sterile oil. Ointments are of value in the crusted, fissured or lichenified stage, but roentgen therapy is preferable. The desquamating stage needs no treatment. Vaccines may be helpful in secondary infections with bacteria. Attempts at desensitization, despite the occasional reports of success with plant oils, have not proved of value. They should be used cautiously, for they may cause severe reactions; this is true also as regards prophylaxis. Conflicting reports are published regarding even the value of Rhus toxicodendron. Antibodies have not yet been demonstrated in cases of contact dermatitis, but more delicate methods may yet reveal their presence.

TABLE 2.—*An Analysis of 204 Cases of Dermatitis Showing Relation Between Recurrences and Length of Service*

Length of Service	Number of Cases: With Recurrence		Number of Cases: Without Recurrence	
Less than 1 month	3		5	
1-5.99 months	6	13%	10	25%
6-11.99 months	5		9	
1-1.99 years	16		15	
2-2.99 years	10	34%	10	39%
3-4.99 years	11		12	
5-9.99 years	28		14	
10-19.99 years	21	53%	11	36%
20 years and over	8		10	
	108		96	

DERMATITIS DUE TO INTERNAL CAUSES

In cases of dermatitis from internal causes, drugs are the main factor causing dermatitis medicamentosa through ingestion, injection, absorption or inhalation. Antibodies have not been demonstrated in drug eruptions. These eruptions are prevalent, for almost any drug may cause a reaction in a susceptible person. In fact, the sudden appearance of any eruption without a systemic disturbance suggests a drug as a possible causative agent. Such eruptions are symmetrical and pruritic and may assume any type or combination of the primary lesions. An interesting group is that of fixed eruptions which do not suggest permanence but tend to reappear at the same site. These are vascular and polychromatic in appearance and are occasionally accompanied by vesicles and bullae. I have seen one case of a generalized bullous eruption in which an area of necrosis on the lower right leg was produced by too large a test dose of phenolphthalein. Cutaneous tests have not proved their value in drug eruptions except in eczematous groups, where patch testing is useful. More promising methods are a study of the case history and the administration of a test dose of the suspected drug, which however must be very small, since even a minute amount may induce a severe reaction in a hypersensitive person. Dermatoses caused by hypersensitization must always be differentiated from those caused by overdosage or accumulation. Two illuminating industrial cases due to inhalation are recorded:

R. C., a woman working on suppositories, using lycopodium as a dusting powder, suffered from attacks of sneezing and wheezing accompanied by herpetic lesions on the alae nasi. She gave a positive reaction to the scratch test with the lycopodium.

J. H., a man, handling burlap bags, suffered from sneezing, sore throat, edema of the lids and erythema of the face and neck. He too gave a positive reaction to the scratch test with fibers from a particular type of burlap.

INFANTILE ECZEMA AND DISSEMINATE NEURODERMATITIS

The human skin is becoming increasingly rebellious to the exposures of our so-called civilized manner of living, adornment and diet. In infancy such rebellions are called infantile eczema and may be classified as contact, infectious, metabolic or seborrheic dermatitis, and atopic when there is a family history of hypersensitization. Classification however is quite impossible at this time, for all such eruptions present the same marked erythema and oozing of the face with scattered areas on the body and extremities. Cutaneous tests are of little value owing to the hypersensitive skin of the infant. Family history is valuable in determining the prognosis; that is, when the disease is atopic. Many infantile eczemas clear up before the end of the second year and the patients remain well. Others, however, persist or recur in later childhood or adult life. These tend to become localized in the neck, the flexures and the dorsa of the hands and assume chronic characteristics, papules, fissuring, excoriations and lichenification, arranged in dark grayish plaques. Years may intervene between attacks. Occasionally this type of disease manifests itself first in the late teens. Many dermatologists call this condition disseminated neurodermatitis; others, atopic dermatitis. I myself prefer the former term, although the latter may be used when there is a positive family history of hypersensitivity. These cases show an eosinophilia, specific circulating antibodies or reagins (not precipitins) demonstrable by passive transfer, and positive intracutaneous and usually negative patch tests. The antigens are mostly protein. White dermatographia may be elicited by stroking the skin. As to etiology, however, the literature is full of contradiction (fig. 6).

A psychogenic origin is advanced by some observers and decried by others; a positive family history of hypersensitivities is reported in about half of these cases. Some investigators find these patients highly intelligent while others record them as of average or below average mentality. Some find seasonal exacerbations worse in summer, while others blame winter climates. Foods, particularly fish and eggs, are accused, as is silk and wool clothing. While I do not credit a psychogenic origin for such disorders, it has been my experience that most patients were fairly intelligent, some extremely so, that less than 20 per cent have a positive family history, that attacks were more pronounced in winter and that acute exacerbations might be induced by worries or mental and emotional upsets.

Testing at such times, by increasing emotional strain, may well invite disaster. In hospitals, with a house diet and lying on an old mattress, the patient may find relief. A shrewd evaluation of the factor which brought on the attack, questioning on financial and domestic worries and dietary, social and occupational habits may suggest future therapy and certain beneficial tests. In one case an inhalation test with silk in an allergen-free room produced a brilliant cure. However, investigation usually reveals polysensitivity so that the elimination of any one factor rarely brings complete relief. Hospitalization, therefore, does not produce a cure. Such patients recover temporarily but fail to cope with their environment, mental and social, and suffer recurrences until maturity and intelligent self adjustment bring a cure. Credit then commonly goes to the attending physician or to the elimination of such substances as eggs from the diet or silk from the wardrobe. Cases of neurodermatitis disseminata are rarely seen in persons of middle age. Persistent contact dermatitis may present all the clinical characteristics of neurodermatitis. History taking and patch tests, however, aid in making the differential diagnosis. Cutaneous tests are likely to yield conflicting evidence. Negative tests, when the patient is known to be hypersensitive to a given substance, are difficult to explain. The reverse is also puzzling—a positive test without clinical symptoms. Moreover, a test which is positive one day may be negative on another, or vice versa. An explosive reaction may follow the mere ingestion of or contact with a causal factor, while later a similar exposure may prove innocuous. Many factors doubtless contribute to this confusing situation; overexposure to a given substance, fatigue, worry, emotional upsets, intercurrent infection or some systemic disease. Hence both the predisposing and the precipitating causes must be sought, and both may be internal or external.

PATCH TESTS

Patch tests in dermatology are more effective than scratch or intradermal tests. The patch test is based on the principle of specific altered reactivity or hypersensitivity. If a patient exhibits an eczematous dermatitis as the result of hypersensitivity to a given substance, the entire skin becomes sensitized. When this substance is then applied to an intact area of the skin in a manner similar to the initial exposure, a reaction comparable to the original eruption should appear on the test site. How this generalized sensitization is produced is still a matter of conjecture; whether it is spread by means of the blood or lymph or in the skin from one epithelial cell to another. Any dermatologist familiar with a large series of contact dermatitides is at a loss when he attempts to satisfy himself that they are spread by epidermal extension.

In patch tests it is important to duplicate, so far as possible, the original exposure. A list of primary irritants must be established. If a worker comes in contact with a primary irritant during his labors or elsewhere, patch tests are needless. If they are also sensitizers, destructive action may result at the test site, and a generalized dermatitis may follow; for example, oil of cinnamon and oil of cashew nut shell. Tests with stock solutions may suggest possible clues but cannot be accepted as proofs.

Experience teaches discretion. Such tests are rapidly assuming unexpected and unwarranted legal importance. A court has recently been questioned as to medical practice which failed to apply patch tests. A physician can testify only to results of tests that he himself applied. Whether the test substance was the one which caused the trouble or merely resembled it may be brought into controversy. Tests with stock solutions are inadmissable as evidence. The commissioner at the industrial accident board recently ruled out my opinion because I could not recall whether the insurer or the patient had brought test materials to my office the previous year.

Tests, when corroborated by clinical data, are of value. Cure or renewed attacks should follow elimination or reexposure to the proved irritant. A positive reaction after a week's interval is usually a sensitivity produced by the test itself. Reactions from rubber and dyes are likely to be delayed. After tests have been applied to the skin, the patient should remain under observation for at least an hour; the sites should be examined before dismissal and, if negative, be replaced for from twenty-four to forty-eight hours. The area tested should be examined for several days. An industrial physician in a recent article stated that during preemployment examination he made patch tests with phenol formaldehyde resins in which he "superficially scarified the skin and many of the new workers were found to be hypersensitive, showing a reaction immediately or within twenty-four hours." Evidently the patch test is not yet clearly understood. The skin should never be traumatized before or during the application of test substances but should always remain intact.

PREVENTION

Prevention can be accomplished by education. Public talks to the laity, to employers and to workers are of value. Contacts such as poisonous chemicals and plants should be explained. Few persons are immune to irritants. At our clinic twenty-three paid volunteers allowed poison ivy leaves to be rubbed on their unabraded skins, which were then covered with sterile gauze. Twenty reacted positively in from one to eighteen days, with varying degrees of dermatitis. One subject showed a generalized eruption from this single contact. The public should be taught that drugs are common sensitizers and should become sensitivity conscious. If a dermatitis appears after the use of any drug, that drug should be suspected and eliminated and another drug of equal value substituted in its place. For example:

> An intramuscular injection of estradiol benzoate was followed by an area of erythema, edema and pruritus at the site of the injection; this was about 3 inches in diameter. This persisted for about three weeks. The same type of estrogenic substance in a different vehicle was injected with no further trouble.

This prevented an extensive dermatitis such as was reported from repeated injections of theelin, in which case each injection caused an extension of the existing eruption.

Many disasters have been prevented in the past thirty-five years by the Council on Pharmacy and Chemistry of the American Medical Association. As a result of the federal drug and cosmetic act the public is becoming educated to the risk inherent in the use of certain drugs. The Food and Drug Administration has already attempted to prevent the sale of certain drugs without a doctor's prescription. Warning state-

ments are placed on the labels, for example "If a skin rash appears, discontinue use." Reliable drug houses have shown an encouraging spirit of cooperation by discountenancing the indiscriminate sale of dangerous products. In fact the entire industry seems conscious of the advisability of ethical marketing. When the manufacturers of cosmetics also disclose by labels the main ingredients of their products, persons with known sensitivities can avoid possible causes of dermatitis. Labeling is important also in industry, particularly for volatile solvents, essential oils and irritating chemicals. If such substances cannot be eliminated entirely, workers should be instructed and preventive measures instituted. If a drug such as mercury is to be applied to the skin, the patient should be advised to test himself prior to its extensive use.

Case reports are continually augmenting our knowledge of irritants and sensitizers and should prove their value in avoiding cutaneous disorders. However, a useful drug need not be banned because of the risk of a dermatitis when that risk is outweighed by the curative properties of the drug in question. Among such drugs are the arsphenamines, sulfanilamide, the iodides and the bromides. After initial disturbances a patient may become more tolerant of a remedy so that its use can be resumed with corresponding advantage. What is true in the case of an individual drug is true of industry. With proper care and observation a sufferer from industrial dermatitis may learn to adjust himself to conditions that seem decidedly unfavorable. Such experiences are common among bakelite molders, treers and bakers. Proper hygiene, both personal and industrial, is and will remain paramount.

CONCLUSION

Eczema, a symptom complex, denotes a dermatitis caused by a normally innocuous exposure which in most cases has been proved to be external in origin. The term allergy may be accepted according to the definition of a specific altered capacity to react, if the causative factors can be specified, as in the case of bacterial infections. The statement that a patient has an allergic dermatitis or eczema is of no value; it must be demonstrated that the patient with the dermatitis has a specific altered capacity to react, or cutaneous hypersensitivity, to a specific exposure or exposures. The fact that a certain percentage of persons who have suffered from contact dermatoses can readjust themselves to previously harmful exposures would indicate that they have no permanent abnormality as a result of their previous hypersensitivity.

520 Commonwealth Avenue.

The Ordinary Everyday Things.—All mothers frustrate their children, but the mother of the sort I am describing, having no sympathy or patience, increases the inevitable frustration a hundred or thousand fold. Instead of sympathizing with the jealous child she is angry, instead of comforting him when he is miserable she gives him a slap, instead of joining in his play she puts him to bed, instead of taking part in his phantasy life she accuses him of lying. It is not that she uses any particular form of punishment or indulges any special cruelty. It is not that she says or does anything very terrible; but the way in which she does and says the ordinary everyday things of life is what seems to damage the child. When he is treated in this way, it seems to me small wonder that the child develops a greater degree of rage, jealousy and libinal demand than the average.—Bowlby, John: The Influence of Early Environment in the Development of Neurosis and Neurotic Character, *Internat. J. Psycho-Analysis* **21**:154 (April) 1940.

PRESENT TRENDS OF SOCIALIZATION OF MEDICINE IN RELATION TO MATERNAL WELFARE

CHAIRMAN'S ADDRESS

LUDWIG A. EMGE, M.D.

SAN FRANCISCO

The complications of modern medical practice resulting from our economic upheavals demand immediate and momentous changes in our professional attitudes. We are confronted with new problems and new ideas which call for a complete change in our ideals. We are told that individualism in our field no longer has a place and that we must organize our forces and prepare for a new tempo in the distribution of medical care. Numerous plans have been drawn and at this particular moment are being tested for the solution of the perplexing health problems arising from the economic changes of the past two decades.

Our particular concern in these plans is maternal and child welfare, which is in dire need of improvement. We have been told time and again that the maternal risk in this country is too high and that better methods must be devised to correct it. Various surveys have shown that the risk is greatest among those who are financially handicapped, and attempts at improvement by various isolated groups during the past twenty-five years have demonstrated that much can be accomplished through group action toward the establishment of maternity centers and educational campaigns. The splendid efforts on the part of the Children's Bureau in Washington to support these commendable movements and provide facilities is well known. The sum total of the experiences of the various groups directed toward the reduction of maternal risk has proved that the results depend entirely on cooperation, efficient organization and adequate funds.

By and large, medical practitioners are individualists and, by tradition, isolationists. Group effort to many means the surrender of these ideals, although there is no proof for this contention. In fact, group action means nothing more than the intelligent coordination of individual efforts. Now, more than ever, is individual effort needed to lower the hazards of childbirth, for they have become the concern of the nation. It is evident that to achieve this the adoption of some plan along the lines of socialization is necessary.

AIM OF SOCIALIZATION

Under the influence of democratic principles and ideals, socialization has come to mean economic preservation and efficiency. Industries are applying its principle in an ever widening scope, and constituted authority has adopted it as the only means of handling the problems created through economic chaos. In the broader sense, socialization aims at the economic betterment of society, and our profession should accept it in that light. If instituted in an orderly and sane fashion to conform with major changes in our modes of living, it is a step forward toward a less complicated community life. All schemes of socialization are predicated on taxable resources or on insurance (compulsory or voluntary). That we interest ourselves in the mechanism of socialization in the field of medicine, therefore, is only common sense and a step in the right direction for our

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own protection. The application of social principles to medical practice is not new. It has been used in one form or another for many years, particularly as it relates to maternal and child welfare.

Originally a problem handled entirely by teaching clinics and philanthropic institutions, this particular field of welfare work gradually has been entered by municipalities, then by counties, later by states, and most recently by the federal government. All will remember the Sheppard-Towner bill and how it was opposed because it was considered the first step toward control of medical practice by the government. Time proved it otherwise, and had it not been for financial limitations and lack of trained workers the results might have been different. The bill was introduced at a time when economic affluence made maternal needs less evident. The economic collapse of the last decade put it to a strain it was not prepared to endure.

The Sheppard-Towner Act was superseded in 1935 by the Social Security Act, which broadened its scope and permitted the Children's Bureau of the Department of Labor and its affiliated state agencies to improve field nursing, increase the number of maternity and child welfare centers and embark on a more extensive educational campaign. It is evident that it has borne fruit, as witnessed by the steady, though slow, improvement in maternal risk.

NATIONAL HEALTH PROGRAM

The federal government now proposes to enter the field of maternal and child welfare on a still larger scale because of pressure from interested nonmedical groups representing that great proportion of our population unable to obtain low cost medical attention, and because organized medicine is said to have been too slow in improving maternal risk. It is planned to spend for this purpose eight million dollars the first year, twenty the second and thirty-five the third, to be followed by such sums as Congress deems necessary to maintain adequate care for expectant mothers and their offspring. This provision is incorporated in a bill (S. 1620) introduced by Senator Wagner to establish a National Health Program. It has been heard in committee, and a copy of the record is readily obtainable. Those who care to know the opinions of leaders in medicine, labor, economics, farming and various industries concerning the distribution of medical care in general, and maternal and child welfare in particular, should read a copy of these hearings. They are very informative and reflect the needs and demands of the people. I recommend also that they study the proceedings of the National Health Conference and the Conference on Better Care for Mothers and Babies held in Washington, D. C., in 1938. It will enable one to compare the opinions of one's colleagues with those who are clamoring for improvement in medical service. Physicians should be conversant with both in order to meet public challenges.

Briefly, the proposed legislation is designed to permit the states to render increased service to pregnant women and to children through grants-in-aid. It is meant particularly for the improvement of rural conditions and for areas suffering from severe economic distress. This bill authorizes the chief of the Children's Bureau in Washington to determine the financial needs of the various states and allot to them sums of money based on the total number of births in the preceding fiscal year and on other health needs of mothers and children as estimated by state authorities. The proposed legislation differs from the Social Security Act in that it eliminates the fifty-fifty participation by the states in the provision of necessary funds and proposes to contribute grants ranging from 33⅓ to 66⅔ per cent of the total amounts to be expended under state plans. It is evident, under the Social Security Act of 1935, that states suffering most severely from economic depression, and hence limited in taxable resources, did not receive as much federal support as needed and that states better able to finance their own maternal welfare programs received more than necessary. While there is an improvement over the Social Security Act, it still fails to take into consideration the fact that certain local needs cannot be measured in terms of finances and therefore it may fail to solve some of the pressing medical requirements of such regions. This section of the bill obviously needs revision.

There are incorporated into this bill certain restrictions and administrative rules which make the chief of the Children's Bureau, under the Secretary of Labor, the sole judge in all matters pertaining to the fulfilment of this legislation. It is evident that such a concentration of power may become a dangerous factor. A farsighted chief, such as the present one, probably would consult with the medical profession regarding needs and methods best suited for a given region. A more arbitrary and politically inclined person, on the other hand, might impose measures which easily could prove obnoxious to the practitioners and thereby defeat the spirit of the bill. I wonder if physicians realize that the distribution of funds for medical care is essentially in the hands of social agencies. This may be an administrative expedient, but it puts physicians in the back seat. We should be at the wheel, and we can be if we insist that all federal medical matters be concentrated in a Department of National Health, as emphasized in the Platform of our Association.

CARE OF MIGRATORY WORKERS IN CALIFORNIA

Until a few years ago, medical practitioners managed very well on their own, and their willingness to care for the sick without material reward was recognized throughout the country. Our present economic situations, however, are changing, and even our contribution of a million dollars or more a day in professional service does not solve the urgent medical needs of certain sections. Take, for instance, our recent experience in California. For several years many thousand disconsolate, underfed and destitute migratory workers poured into the state in a steady stream. Who was to care for their pregnant women and their sick children? Was it up to the nearest local physician or was it the duty of local health authorities to provide adequate and decent care? Or was this a federal responsibility? In many instances the brunt was borne by the local doctor until the problem got beyond him. Regardless of what has been said in sordid fiction, I know from personal investigation that many members of our profession and local health departments did their level best under the circumstances, but it was not adequate. To achieve the desired end, forces had to combine. Improvement came when state, federal and medical forces joined hands to provide means and facilities for relief of the suffering. Today, mobile clinic units follow the workers to the crops, stationary maternity centers manned by part-time physicians and dentists have been established in convenient localities, and every migratory pregnant woman in the state has access to adequate care. Sometimes superstition or ignorance keeps a woman from making use of the facilities offered, but we cannot help that.

Last year 2,259 of 2,932 migratory women were delivered in hospitals, a considerably higher proportion than is true of most rural districts in the nation. This demonstrates what efficient organization and group effort can achieve, and it demonstrates at the same time that the individual physician could not cope with such events. Like emergencies may arise in any state and, while they are primarily the concern of health departments, our profession is bound to be drafted. So why not organize and be prepared?

IMPROVEMENT IN MATERNAL MORTALITY

There is another phase of the maternal welfare problem which I believe can be solved only through some form of medical socialization, and that is the present state of our maternal mortality. All are familiar with maternal risks in the United States as compared with those in other countries. It long has been a subject of concern to most of us and has given us a black eye before the public. What are we going to do about this? Shall we organize and strike at the root of the evil, as a few isolated groups have done, or do we want the government to do it for us? If we expect to assume the leadership in this matter we must prepare ourselves to set aside certain archaic ideas of ethics for the sake of eliminating the incompetent. If we want to be led, then the public, through the federal government, will tell us who can and who cannot attend women in childbirth. Remember the reports on maternal mortality by various interested groups and the impressions they created, not only in their respective communities but throughout the country! There was a great deal of criticism within the profession over these reports, but they did have a salutory effect. They awakened many doctors to the necessity of increasing their efficiency through graduate study, and they stirred up various health agencies to foster better maternal care. Call these efforts at improvement what you please; in the final analysis they are a form of socialization, since they are concerned with group action for the benefit of society.

To show where there is the greatest need for improvement, I have prepared a table of maternal mortality rates supplied by the Children's Bureau of the United States Department of Labor. It is arranged according to the number of deaths per state in 1938 as compared to 1936. The table speaks for itself; each should make one's own deductions.

Let me say in passing that the Negro population of all states has a higher mortality rate than the white population. This, no doubt, explains the alarmingly high maternal mortality rates in certain Southern regions where the proportion of Negro births is highest. Negro births in the Southern states fall for the most part into rural districts and are accompanied by a far greater mortality than in the Northern states, where the colored population concentrates in towns and cities. The situation evidently will have to be remedied through some social scheme sponsored by constituted authority and made effective through medical cooperation. If the number of Negro physicians and public health nurses is not sufficient to cope with the problem, then some other way will have to be devised, preferably through a combination of public health forces and county medical societies.

As a matter of record I wish to point out that, notwithstanding recent statements made at health conferences and hearings, maternal risk in general is decreasing steadily and maternal mortality rates have improved universally. I am certain that medical group efforts, educational campaigns fostered by teaching institutions, the Children's Bureau, medical societies, numerous state welfare agencies and the American Committee on Maternal Welfare have contributed immeasurably to this achievement. The development of obstetric graduate study is the next step to improve the situation further. It too is a cooperative effort and a phase of socialization, since it aims to improve medical practice for the amelioration of the health of the public.

Maternal Deaths per 10,000 Live Births

	1938	1936		1938	1936
North Dakota	24	43	Idaho	41	44
Connecticut	26	41	Kansas	41	57
Minnesota	28	42	Kentucky	42	56
Rhode Island	28	40	Oklahoma	42	62
Wisconsin	29	42	Colorado	45	71
			Maine	46	51
Utah	30	44	Arizona	48	91
Nevada	32	56			
Wyoming	32	50			
California	33	47			
Iowa	33	46	North Carolina	53	66
Montana	33	55	Virginia	53	58
Washington	33	52	Arkansas	55	76
Illinois	34	45	Delaware	56	71
Nebraska	35	50	District of Columbia	56	69
Oregon	35	54	Tennessee	56	70
South Dakota	36	46	Texas	56	69
Indiana	37	48	New Mexico	57	74
Michigan	37	52	Louisiana	59	87
New Jersey	37	40	Mississippi	59	69
Vermont	37	50			
Maryland	38	47			
New Hampshire	38	48	Georgia	67	82
New York	38	49	Alabama	68	74
Ohio	38	50			
Massachusetts	39	49			
Missouri	39	61			
Pennsylvania	39	52	Florida	75	81
West Virginia	39	53	South Carolina	79	90

HOSPITALIZATION

There are many other phases in the care of the pregnant woman which cannot be solved except through some social scheme. Take, for instance, hospitalization. Today it costs roughly from $5.50 to $6.50 a day to house, feed, nurse and deliver a patient and take care of the baby on the basis of a ten day hospital stay, with an additional dollar or two a day if a physician-anesthetist is employed. It is evident that this puts hospitalization beyond the reach of a very large proportion of our pregnant women. This phase of the problem cannot be solved by philanthropic aid or by the present setup of county hospitals, many of which hardly deserve that designation. Today even those of moderate incomes often cannot afford adequate hospital care unless it is provided through hospital insurance. However, since it is more expensive to hospitalize maternity patients than others, voluntary insurance groups are slow to include this service in their policies. It will take some time to learn whether, under the present rates and restrictions, this service ultimately can be provided. In the meantime, from 20 to 70 per cent of our expectant mothers, depending on whether they are living in urban or rural districts, are forced to have their babies at home. If it is to be the ultimate national aim to have all babies born in hospitals, the financial burden must be borne by constituted authority through some means of taxation. That this requires the setting up of some social mechanism needs no comment. Certain of our lawmakers contemplate the institution of a nationwide hospital building program which, I fear, in the proposed form is not entirely based on necessity. I cannot go into the details. They can be read in a bill (S. 3230) known as the Wagner-George Hospital Construction Bill, which recently was discussed in THE JOURNAL. It is a very ambitious and

expensive scheme of socialization which throws the ultimate maintenance cost onto the community and still does not solve the individual hospitalization cost, although it is claimed that this would be achieved through funds provided by the National Health Act. I am unaccustomed to large figures and cost sheets, but I can see that even the sums set up by that act would not nearly cover the cost of hospitalization of expectant mothers now delivered at home, to say nothing of compensating the attending physician. If the federal and state governments want to increase maternity hospitalization they could do so by adding to or subsidizing present facilities with a tremendous saving in capital investment and in administrative cost. Here again cooperation and solidarity in the medical profession can play an important role. An equitable and satisfactory distribution of the burden of the cost of hospitalization for that large group now not eligible or not able to afford it can come only through a plan of socialization, and our profession can show the way to the most economic solution of this problem.

Time does not permit the discussion of many of the interesting details which enter into social schemes connected with maternal welfare. The question of compensation for adequate maternal care I leave out purposely, because it cannot be answered without considerably more experience and study. However, this phase will have to be watched for the tendency is to put the valuation of maternal care at the end of the list.

POSITION OF PHYSICIANS IN ADMINISTRATION

We are charged with the responsibility of watching over the welfare of mothers and babies and we should let it be known that we want a hand, not only in their practical care, but in administrative matters concerned with the distribution of funds for such purposes. It is high time that the profession make itself heard, and it is to the interest of every practitioner to lend a hand. I feel very strongly that this subject must be brought out into the open so that the people with whose care we are charged can learn our ideas regarding national health programs. If we ever want to be heard, we must raise our voices now, and when we do, we must speak with conviction and be prepared with practical suggestions. Health legislation affects you and me vitally, and, since it is evident that the health needs of certain groups can be supplied only through some governmental subsidy, by all means participate in the shaping and enforcement of such legislation. Do not relinquish leadership in medical matters, for by nature of your training and experience you are best prepared to lead in that field. Above all, remember that the burden of maternal mortality rests on our shoulders, so why not make a serious, united effort to lighten that burden? A little more cooperation, a little more frankness and a lot of good will would go far in achieving this for us. Prove to your community that it must provide better facilities for its expectant mothers and aid in the establishment of maternal and child health centers. Create study groups and discuss your problems together, and invite particularly proficient practitioners to discuss them with you. What has been done to improve maternal risks in the large centers may be accomplished in the smaller communities and rural districts if your respective county societies will determine the causes of deaths in childbirth in your own localities and study the existing facilities for maternal care. This will require an effort, and some feelings may be hurt, but why not look at it in the spirit of service? Individualism need not be lost. Many of you belong to civic societies and you take pride in being of service to your fellow men. Has not medicine ever been dedicated to service? The time has come for all of us to apply this principle to changing needs, but it cannot be done by merely quibbling over the philosophy of social trends; it requires action—organization and cooperation—and this must come from within our ranks.

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INJURIES OF THE KIDNEY

WITH SPECIAL REFERENCE TO EARLY AND ACCURATE DIAGNOSIS THROUGH PYELOGRAPHY

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What with modern high powered automobiles and the ever lengthening superhighways of America, there is a sickening tide of broken and torn bodies streaming steadily into the admitting wards of our emergency hospitals everywhere. With a public still sadly indifferent to the horror of this mounting holocaust, a responsibility of particular weight rests on the profession to whose lot it falls to comfort and to heal. While those of us committed to the practice of urology find ourselves involved in this mess perhaps less frequently than our friends the orthopedists or the general surgeons, present day accident surgery is freighted with perplexing urologic problems sufficiently common and of such wide variety as to command our most thoughtful attention.

Not alone have recent years brought an astounding increase in the number of cases of injury involving the organs of the urinary tract but at the same time they have brought such astonishing changes in their type and degree that several new questions of major significance have risen to plague us. Not the least of these—and I venture here to inject perhaps the most confusing and unanswered of them all—is that of the safest and best methods to be used in the early recognition and the precise classification of kidney injuries. It is to this particular phase of accident surgery that this paper is addressed.

To any one called on to serve as consulting urologist on the staff of a sizable emergency hospital, it must soon become apparent that the mine run of urinary tract injuries are quite symptomless and obscure on admission. Indeed, so obvious and commanding are the symptoms of the other accompanying injuries and so silent those of the kidney or bladder that important hours are often lost unless the prompt discovery of kidney or bladder injuries is assured through the routine inspection of the urine to note the presence or absence of blood in all accident cases at the time of admittance. Without such a routine, the patient with a fractured pelvis may go many hours before her ruptured bladder is discovered or the man unconscious from skull fracture even bleed to death from an unsuspected kidney injury.

Striking too is the observation that frank hematuria can be noted in bad accident cases and yet the most painstaking search fail to reveal any demonstrable urinary tract injury and a few days see the urine again clear and the patient apparently none the worse for

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the wear. Particularly is this likely to occur in those accidents in which bodies have been jarred violently by falling, by being slammed against a tree while coasting or in a head on collision with another car. Along with punctured lungs, broken limbs and skull fractures, a sizable number of these heavy body injuries are found to show grossly bloody urine perhaps clearing completely within a day or two but eloquent evidence of the fact that the royal tissue of a kidney is too soft and friable to be slapped against the lumbar spine without likelihood of some degree of injury.

Injuries of the urethra and of the bladder are so classic in their method of occurrence and they are associated with such characteristic local effects that any reasonable investigation is bound to lead to their prompt discovery and, once discovered, their treatment is quite routine. The trouble does not lie there.

Rather, the real problem in injuries of the urinary tract lies in that group of cases in which the kidney has been hurt. And the reasons are not hard to find. Here, unlike injuries lower down the tract, there is not the likelihood of urinary extravasation to make immediate surgical intervention imperative. Here hemorrhage alone is a danger and then only in the most occasional of cases. Here surgical intervention is a formidable procedure and altogether too risky to be undertaken without real cause. Here, as a matter of fact, experience teaches that the vast majority of injuries are far better left alone. Indeed, the problem is not so much that of detecting the presence of kidney injury as it

Fig. 1.—The contour of the renal pelvis is well preserved despite substantial fracture of the renal cortex.

is of knowing the exact extent of the injury and whether or not operation can safely be avoided.

In approaching the answer to this question there is nothing whatever that ranks with a clear understanding of the exact extent and severity of the kidney injury itself. Of course severe shock when present may be of outstanding significance. Signs of progressive hemorrhage may be quite commanding. Injuries elsewhere in the body may tend to dominate the whole procedure. Even perirenal extravasation of urine with the likelihood of later abscess can demand consideration. Completely overshadowing them all, however, stands the paramount question How bad!y is the kidney hurt? Is it fragmented and macerated beyond hope of spontaneous repair? Or are its bruises and tears within

Fig. 2.—The contour of the renal pelvis is completely lost. The kidney was found fractured beyond possible repair.

the bounds of good healing if merely left alone? On the answer to that question, more than anything else, rests intelligent judgment as to proper treatment when kidney injury has occurred.

Two cases are submitted in illustration of this point:

A middle aged man who had been bowled off his feet two hours before by an automobile entered the hospital in moderate shock. Urine obtained by catheter was found to be quite bloody. Rapidly increasing pain and rigidity suggested left kidney injury and careful urologic studies were made (fig. 1). It was perfectly obvious from this retrograde pyelogram that frank fracture of the left kidney had occurred. But it was also obvious that the kidney and its true pelvis were sufficiently intact to promise good healing. After eight days of bed rest the patient saw so little excuse for his hospitalization that he signed his own release and left. Urologic studies made in connection with litigation the following year demonstrated this kidney to be functionally and anatomically indistinguishable from its uninjured mate.

A grown girl too drunk the night before to know how she had been hurt came to the hospital about noon frightened over her bloody urine. Nor, oddly enough, was there a bruise or a scratch on her body to hint the presence of her injury. A growing dull ache over her left kidney suggested that it might be the source of her bleeding. Cystoscopy showed blood rolling from the left ureteral orifice. This retrograde pyelogram disclosed complete loss of continuity of the renal pelvis and indicated that the kidney to be injured beyond possible repair (fig. 2). Her general condition remained quite good and operation seemed both safe and wise. The kidney was found broken completely in two with an upper and lower half dangling loosely in a quart of clotting blood, one anchored by a few viable shreds of pelvic mucosa and the other by the skinned renal artery and vein.

Several authors have written, praising intravenous urography in the study of renal injuries and calling

particular attention to its simplicity and complete safety. Be all of that as it may, there is much to question its worth except, perhaps, as the roughest sort of a preliminary survey in those accident cases in which the urinary tract is suspected. Most intravenous urograms made on patients just admitted after serious accident

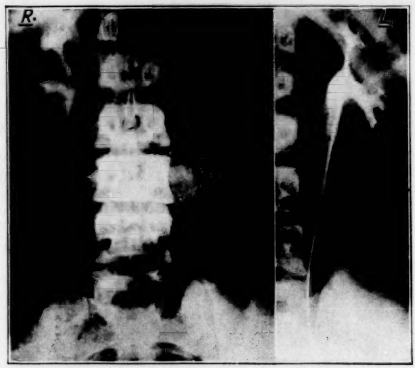

Fig. 3.—The intravenous urogram showed no elimination of the drug by the injured kidney. Yet the left pyelogram proved the kidney to be quite intact.

are, in my experience, quite valueless. If the patient is seriously hurt he is likely to be in shock, and shock is a poor circumstance in which to expect even uninjured kidneys to do a reasonable job in eliminating the drug in sufficient concentration for good pyelographic detail. Ileus, more or less severe, is also quite common and adds to the difficulty of getting clearcut, distinguishable outlines of the pelvis and calices.

Entirely apart from these general considerations, the intravenous urogram finds serious limitation in the fact that, far more often than not, a kidney stops secreting urine promptly on receipt of injury, whether that injury is one of simple concussion or of a severe shattering of its parenchyma. Not only does this usually leave the surgeon without the information he so seriously needs, but by what appears to be complete absence of function it may give an impression of kidney damage thoroughly false and gravely misleading.

In support of this contention I submit a twenty minute intravenous urogram, together with the left half of a retrograde pyelogram (fig. 3), both of which were made quite soon after the patient's admission. The case was one in which the type of violence and the severity of symptoms suggested the likelihood of serious left kidney injury. While the right kidney was well visualized in this intravenous urogram, on the left side nothing but a faint streaking of dye in the kidney region could be seen. Had this intravenous urogram been taken at face value, one would have expected to find the left kidney badly damaged. Yet the retrograde pyelogram proved the kidney completely intact except for an insignificant medullary tear and several days of bed rest saw the patient well and home again.

Retrograde pyelography, done on a proper x-ray table and with a Bucky diaphragm, must come to be routine in all accident cases in which injury to the kidney is suspected. I would take issue even with those who point to the supposed hazards of such a bold regimen. Using the newer drugs and with sterile technic, no serious harm can possibly come from retrograde pyelography—certainly nothing to equal the danger of case management without it. A good retrograde pyelogram will prove beyond reasonable doubt whether or not renal injury has occurred. Of vastly greater importance, however, it will usually show if the parenchyma and the pelvis have been shattered beyond all possible hope of decent healing. With the contour of the renal pelvis reasonably well preserved, even though frank rupture of the parenchyma may be quite evident, one does not expect serious consequences to ensue and a masterful indifference on the surgeon's part is quite likely to see the patient and his kidney both whole and well again. Conversely, if the pyelogram shows the continuity of the pelvic cavity blasted beyond recognition, there can be no hope whatever for the kidney and but little for the patient unless a propitious time for nephrectomy can be found.

Two cases have been chosen to illustrate the truth of these observations:

A young man who had tumbled down through six floors of scaffolding suffered nine more or less serious bone fractures along with lesser injuries. He entered the hospital in profound shock and was unconscious from severe brain concussion. After several hours of supportive treatment he rallied sufficiently to permit a thorough study of his injuries. The catheterized urine was thick with blood. Severe pain and boardlike rigidity soon settled over the entire left side and back. Cystoscopy showed blood running from the left ureteral orifice. The retrograde pyelogram (fig. 4) gave eloquent proof of the presence—and incidentally the relative inconsequence—of his renal injury. Particularly one should note the unbroken contour of the entire pelvis and its three main branches while the fog of pyelographic solution floating between upper and middle calix demonstrates the location and limited extent of the parenchymal fracture. This patient was months in the hospital following his accident, but except for his bone injuries he might well have been out and at work within the week.

A daughter just reaching womanhood had the misfortune to be shot in the back by her degenerate father. The bullet

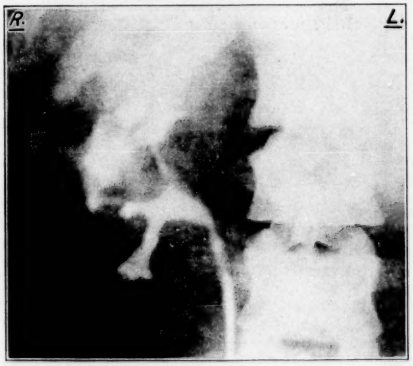

Fig. 4.—Retrograde pyelography proved the kidney pelvis completely intact. A small fracture of the renal cortex may be seen spreading between the upper and middle calix.

entered at the left of the upper lumbar spine, emerging high in the left axilla. On admission her clothes were noted heavily blood stained but there was no indication of alarming hemorrhage. She was neither in shock nor in material pain. However, as hours wore on her pulse began to quicken. Pain, tenderness and rigidity localized in the left hypochondrium. Distention and vomiting appeared and increased steadily. Indeed, all signs seemed more and more to point to an abdominal

injury—that is, all except the heavy bloody discoloration of the urine. A retrograde pyelogram (fig. 5) was promptly made, whereupon it became evident that the left kidney had been caught by the bullet in flight and that severe damage had occurred. Indeed, the film seemed to indicate all but the extreme upper pole of the kidney to have been shot completely away. True to this prediction, operation disclosed a quite normal upper pole with the rest of the organ pulverized beyond recognition. With this kidney remnant removed and two small wounds in the large bowel located and closed, we hoped that we had spared her life. But the paths of bullets are notoriously weird and devilish, and a coroner's inquest came along in due time to enlighten and deflate us. Through all our error and

Fig. 5.—In this gunshot injury retrograde pyelography proved of uncanny accuracy in predicting that, except for an intact upper pole, the kidney would be found shattered beyond recognition.

confusion, however, there was one feature of her case that was perfectly clear from the very start. Thanks to our pyelogram, we were never in the slightest doubt about the condition of her injured kidney and what had to be done about it.

CONCLUSION

In closing this scanning recital of certain observations concerning kidney injury permitted through many years of an active emergency service, I should like to stress from among them:

1. Immediate examination of urine, either voided or catheterized, must be made absolutely routine in all accident cases. Considering the danger that lurks in hemorrhage and particularly the terrible consequences of urinary extravasation when it occurs, altogether too much is at stake to neglect this simple and easy precaution.

2. Gross hematuria in accident cases demands absolutely accurate diagnosis. Many times it proves to be of no particular consequence, but many times also it bespeaks an injury of first magnitude.

3. Intravenous urography can be quite useful as a scout procedure in those accident cases in which the urinary tract is suspected. It must be followed by more exact studies, however, unless sharp outline permits quite exact interpretation and even then if substantial injury seems to be present.

4. Finally, I would reiterate my firm belief that it is in the retrograde pyelogram—and there only—that one can find substantial, dependable and consistent help in determining when and when not to operate on a kidney that has been injured.

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ABSTRACT OF DISCUSSION

DR. ROY B. HENLINE, New York: Dr. Sargent's discussion of renal injury has stressed the value of retrograde pyelography in suspected renal injury. Such a procedure, done under sterile precautions, should afford more accurate information regarding the extent of the renal damage. Using the newer contrast mediums for pyelography, which may readily and harmlessly diffuse with the blood, should add no additional hazard to a patient with a ruptured kidney. One has no reason to regret the performance of retrograde pyelography in these cases, and in several instances more precise information regarding the condition of the kidney has been obtained than was possible by excretory urography. Too many general physicians rely on the erroneous information often obtained from excretory urography. However, many such injuries can be diagnosed by excretory urography alone. Stirling reports a satisfactory diagnosis in twenty-three of thirty-four patients with ruptured kidney by excretory urography. One should not hesitate to perform a retrograde pyelogram in any instance in which the diagnosis and extent of the injury are in doubt or in which the kidney or renal pelvis is not well outlined by an excretion urogram. Many cases reported as ruptured kidneys are merely contusions and require bed rest and supportive measures but no surgical intervention. A true rupture of the kidney, resulting in gross injury to the pelvis, cortex or capsule, represents serious renal damage. These patients should be operated on as soon as the diagnosis is made, provided shock and other injuries will permit. To postpone surgery in these operable cases is poor surgical judgment. The literature contains many such cases treated conservatively too long with a subsequent loss of the kidney or even life. Surgical intervention, if performed early, may preserve a severely damaged kidney, yet the degree of shock must first be determined and treatment instituted for its control before surgery is begun. The most conservative treatment for these patients is prompt exposure of the kidney, repair when possible or early nephrectomy. When doubt persists concerning the extent of the renal injury after all diagnostic procedures have been done, an early exploratory operation is preferable to prolonged expectant treatment.

DR. GEORGE F. CAHILL, New York: Dr. Sargent's paper is timely. Too often diagnostic methods are used by those not familiar with them. In tumor of the kidney an intravenous urogram may not establish a diagnosis but may need retrograde pyelography. So too in renal injury. Renal injuries vary. They may be only a minor portion of a profound injury. With penetrating wounds of the abdomen the kidney is often not a major part of the picture but is obscured by intestinal or other injuries and in the late war the infrequency of renal injuries was due to the fact that most of those seriously wounded died on the field. When the kidney is the major trauma there may be many sources. Automobile accidents are frequent causes especially to those occupying the rumble seat. The symptom most frequently seen is hematuria. When it occurs it should be investigated. I do not see any objection to the use of an intravenous urogram in such cases. If the patient is in shock naturally that condition should be relieved by transfusion and other therapeutic aid and then the intravenous urogram done. The secretion from the uninjured kidney shows that it is present. The injured kidney may or may not secrete. If it does and well, then the injury most likely is not severe and expectant treatment is in order. If the kidney does not secrete and an increasing hematoma is present in the flank, then, operation being contemplated, a retrograde pyelogram may be done. If marked local hemorrhage is present, repair of the kidney must be early if the kidney is to be saved. Infection occurring in a

traumatized kidney usually ends in destruction of the kidney. Retrograde pyelography may increase the incident of infection but if one cannot succeed in establishing the renal damage by intravenous urography one then must use other means for its estimation.

DR. W. CALHOUN STIRLING, Washington, D. C.: My experience has been that in the majority of the cases of injuries of the kidney the diagnosis can be made by intravenous pyelography. A recent review of thirty-four cases gave a positive diagnosis in twenty-three, and in only seven instances was it necessary to do a retrograde pyelogram. I believe that instrumental pyelography should be reserved solely for cases in which bleeding continues with unsatisfactory pyelograms. In the presence of severe contusions the first intravenous pyelogram may be unsatisfactory, whereas if it is repeated in from twenty-four to forty-eight hours it will frequently show a good shadow. A majority of the cases reported as ruptures of the kidney are only contusions and respond to conservative measures. My experimental work and clinical studies indicate that, in the presence of severe injury to the kidney, operative intervention is more likely to give a good result than is the conservative method. The literature shows an increasing number of cases with permanent partial loss of function in which the kidney was allowed to heal spontaneously. I have found that when early surgical intervention is instituted, that is the capsule incised, clots evacuated, gauze packs inserted or fat pads sutured over the lacerated area, functional restoration of the kidney will in most instances result. Goldblatt and his associates have shown that hypertension may be produced experimentally by partially clamping the renal artery. Weiss and Parker estimate that pyelonephritis is responsible for at least 20 per cent of the cases of malignant hypertension due to vascular changes. Severe injuries of the kidney produce marked vascular damage which may later cause ischemia of the kidney, followed by hypertension. Patients with renal injuries should be watched for evidence of hypertension. The loss of blood in renal injuries makes anemia an important factor to consider during the convalescence. This complication was not due to the simple loss of blood but to the liberation by the injured kidney of some substance capable of causing toxic destruction of red blood cells. Possibly the degeneration of kidney tissue releases some toxic substance capable of affecting adversely the red blood count and probably the blood pressure. Fat was found to be much superior to muscle in arresting hemorrhage. It is my opinion, based on an experimental as well as a clinical study of a series of cases, that if the kidney is severely injured one should always explore and institute conservative surgical packing, suture and drainage.

DR. VINCENT J. O'CONOR, Chicago: Apropos of Dr. Sargent's paper, practically all of which I agree with, I wish to point out one inference which he makes with which I thoroughly disagree and which I think, since these proceedings are a matter of widespread printing in THE JOURNAL, should be clarified. That is with regard to the length of rest in the cases treated palliatively. Dr. Sargent said in certain instances that individuals could be back at work in a few days following a rather massive hemorrhage which cleared up quickly. In three instances in my own experience in which a more or less minor kidney injury, at least from a clinical point of view at the time of the injury, apparently responded successfully to palliative treatment the individuals, against orders, went back to an active life and all three of them returned with massive hemorrhage which necessitated surgery, coming on as long as four weeks after their discharge from the hospital. One of these patients, who had a massive hemorrhage which lasted only twenty-four hours, responded quickly to four or five days of rest in bed, left the hospital against orders on the tenth day, and returned three and one-half weeks later with a kidney which was completely broken in two following the lifting of a heavy suitcase. Two boys with football injuries were allowed to return to active life. Both resumed playing football within three weeks and both returned with massive hemorrhage which necessitated surgery. I believe that these patients who are treated palliatively should be kept at rest, certainly a period of two weeks, and that their physical activity should be limited for from four to eight weeks at a minimum.

DR. JAMES C. SARGENT, Milwaukee: In making a point of the fact that many renal injuries prove to be quite minor and soon healed, perhaps I gave the impression that I underrated the importance of prolonged bed rest when real injury has occurred. However, I wish it clear that I agree with Dr. O'Conor in the wisdom of keeping these patients down on their backs for a considerable time.

GEOGRAPHIC VIRULENCE OF MASTOIDITIS

MERCER G. LYNCH, M.D.
NEW ORLEANS

For some time the question of geographic variation in the incidence of mastoiditis has been of interest and an attempt at an explanation has thus been undertaken. There is much literature regarding climate in general terms. The weather and season function together as the most important environmental factor from the time of birth to the time of death of an individual. Acute infections of the mastoid reach their peak in the spring following the cold weather, not in the summer, and do not again begin to rise until the fall, when changes, often sudden, are seen.

Throughout the United States there is every variety of climate and of weather conditions. Too, one sees a great variety of peoples from every nation scattered throughout the country. These people and their respective living conditions as well as their racial immunity make them susceptible or resistant to different disease conditions.

An organism virulent to one group of individuals may have little or no effect on another group, and the reverse may be the case. Different diseases are also more prevalent in some localities than in others. However, Streptococcus haemolyticus is universally found throughout the country. Of nasal cultures taken at random throughout the country, 50 per cent of them from any area showed streptococci and the rest were made up of other organisms, so that truly the streptococcus is found in every locality, as it is the most common organism cultured at the time of operation on the mastoid.

Why is it that along the Gulf Coast from Texas through Florida there are relatively few cases of mastoiditis in proportion to the population? As we progress northward along the Eastern Seaboard the incidence and number of cases steadily increase until in Massachusetts and Maine the peak is reached. The same procedure is true for the Mississippi Valley and the country west of the Mississippi. What part does climate play, especially in those localities in which the climate is so variable, and what part do diet, the habits of the population in regard to these different localities and climates, the foods and the incidence and degree of illness of the population play? All these questions fill a rather large order, but an approach has been made to arrive at some conclusion as to just why this should be.

We who live in the deep South in proportion to our population see a rather small percentage of mastoiditis. As one journeys northward, the incidence increases in proportion to the population until the peaks are reached in the northern limits of the United States.

Through the cooperation and assistance of men in other cities throughout the United States, cultures of hemolytic streptococci have been received and indi-

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vidual studies made under different conditions of climate, diet, exercise and illness, the guinea pig being used as the host.[1] When the cultures were received all were transplanted to blood agar and then standard solutions were made so that all solutions were of equal strength for experimental and testing purposes. These solutions were all subjected to various temperatures of heat and cold such as are found throughout the country and to sudden changes in temperatures such as are found in certain localities. Those organisms obtained from the areas having such changes were more resistant than those taken from more uniform climates, where many were inhibited or killed. Therefore the organisms themselves lose some of their virulence and living powers when accustomed to a more uniform climate. But those that remained became in time as virulent as the organisms accustomed to such changes.

Animals of the same age were injected intraperitoneally with the original solutions. Those cultures received from the Middle West and Northeast sections of the country when thus injected produced early peritonitis and death as compared to a longer illness in those from the Central and Southern states.

Animals were then placed under conditions simulating their respective climates for a period of time and the organisms reinjected. The death rate was increased as well as the degree of illness, and the duration was shortened for those animals receiving solutions from the North and the East, the degree of illness increasing as well as the duration of the illness lengthening as one approached the southern climate. These animals, killed and examined post mortem at various stages of their illness, showed interesting conditions. Those injected with the first group showed an early tendency to spread, with little walling off of the infection. The animals that survived the first period of illness showed a late tendency to walling off of the infection. These corresponded with the conditions found at autopsy of animals that succumbed, showing generalized peritonitis with localizing areas or pockets which were walled off.

The animals injected with the second group showed a tendency to an earlier walling off. Many of these survived and showed a completely walled off abscess. However, the tendency was to an early walling off, then slow breaking down of the abscess and a final generalized peritonitis. To draw conclusions, it would seem that early operation is indicated in the first group, whereas one may be inclined to follow the progress of the disease in the second group, but generally it is advisable to operate in both cases, the main factor being time.

Animals were placed under conditions of warmth and sunlight and fed high caloric and high vitamin diets. They were then injected with the most virulent strains from the North and the East. Likewise animals were again placed in cold climates with little sunlight and limited space for exercise, and these were injected with the strains from the South. Of the first group the virulence was markedly reduced, although they still showed a tendency to an early death rate as compared to the same group given the injection from the Middle and Southern states. Those receiving injections of the lesser strains but under the colder habitat showed a lowered resistance and an increase to early development of infection. From this it is concluded that those areas of the country where the climate varies markedly, where extremes of cold are encountered and where open air exercise is thus limited, over a period of time the resistance is lowered and the population is thus more susceptible to infection—this, coupled with the fact that the infection gains virulence because there is less in the natural elements to combat and decrease the virulence. By these factors are meant fresh air, sunlight and exercise.

Clinically, these facts are substantiated by reports showing that the highest incidence of mastoiditis is in March. This peak is reached after a gradual rise beginning in December and January, or at the onset of the extremes of cold. After March there is a steady decline, until the low point is reached in August, the time of maximum sunshine and, although hot, a more regulated and even temperature.

Of the 100 cases of mastoiditis studied by Tomb, the majority were in children, but it is noteworthy that twenty of these patients were housewives who had nursed children with infections of the upper respiratory tract. They had contracted the infection and developed otitis media and mastoiditis. These cases occurred in the winter months when there were poor ventilation of rooms and little or no time for sunshine or fresh air. These conditions are also seen among interns and residents coming from warm climates to be established in hospitals in the East or West and likewise those from the East going South. The majority of these men have a longer period of sickness against their records and are more prone to complications than are the interns who remain in the locality or area to which they are acclimated.

A great deal of work has been done with vitamins in connection with the prevention of disease, the building up of resistance and the elimination and healing properties of tissues in which these vitamins have been used. Space does not permit of a detailed report, but certainly work in this regard shows that, along with the elements of climate, exercise and fresh air, diets rich in vitamins make for better resistance of the patient and a greater facility to throw off infection than by those fed only ordinary diets with no regard to vitamins. Climates vary throughout the country and so do organisms. Individuals likewise vary and are more susceptible or resistant. Generally in milder climates the organisms are themselves less virulent and, because of open air ventilation, sunshine and more access to natural vitamins, the resistance is increased. All these factors must be taken into consideration in an explanation of the geographic virulence and incidence of mastoiditis.

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1. The following men cooperated in sending cultures and only by this means was the work completed: Drs. Fred Pollock, Chicago; Paul Mertins, Montgomery, Ala.; Lester Brown, Atlanta, Ga.; Merrill Wattles, Jacksonville, Fla.; Fred Ogden, Boston; Wallace Dean, St. Louis; Harold Smith, Pomona, Calif.; John Shea, Memphis, Tenn., and Fred Harned, Hopkinsville, Ky.

ABSTRACT OF DISCUSSION

DR. NOAH D. FABRICANT, Chicago: It is possible for any number of environmental factors, such as emotion, diet, infection, intoxication and fatigue, to influence a person, but it is extremely difficult to evaluate them. The weather, however, can be measured. Thus, daily temperature changes are measurable, as are likewise barometric pressure, daily average wind velocity, sunshine and daily precipitation. Every physiologic adjustment necessitated by weather alteration is apt to find reflection in any region of the body that is inadequate. This will find expression either in unusual symptomatology, in change in function or in actual pathologic change in the various organs of the body —factors that are measurable. Consequently we are able to measure both the stimulus, i. e. the weather, and the effect on the human being, i. e. the clinical, biochemical and vasomotor changes that are induced in man. We must adjust ourselves

periodically to two wholly different types of atmosphere or air masses. We speak of these as polar air masses (cold fronts) or tropical air masses (warm fronts). Chilling of the body surfaces causes constriction of the blood vessels of the skin and this is followed by a constriction of the blood vessels of the nasal mucous membrane. A prolonged ischemia of the nasal mucosa reduces the local resistance and favors infection. Local chilling of the body surfaces is often induced by inclement weather. In the wake of a cold front there is a change in the functional status of the mucous membranes of the nose and throat. From a few hours to one or more days may elapse before the clinical symptoms make their presence felt. Although one cold front may be passed without instituting harm, it is often the repeated or superimposed cold front that results in further damage. In a study of the onset of acute otitis media and mastoiditis, I have found that the precipitation of these diseases occurred most often when there was a fall in the atmospheric temperature. The vasomotor and biochemical changes induced in the human being by the passage of a cold front are accompanied by vascular spasm, increased blood pressure and a relative increase in p_H. Gradually the vascular spasm is dissipated, the blood pressure falls and the tissues become relatively more acid and hydrated. At such a time the individual is apt to experience the feeling of fatigue, and during this period bacterial penetration is more apt to occur. Changing environment produces changing energy demands on human organisms that are no longer adequate. Under the continuous pendulation of temperature, humidity and barometric pressure the population constantly swings from a phase in which the vascular spasm is enhanced to one in which vascular dilatation is augmented, and vice versa.

DR. LESTER A. BROWN, Atlanta, Ga.: I have gathered information from each individual record of mastoiditis of three Atlanta hospitals covering a period of six years, 1934-1939 inclusive, using this span of time because of the discussion that follows the present use of sulfanilamide and its derivatives on the incidence of mastoiditis. This comprises an estimated one half total Atlanta survey. It is divided into the three years before the introduction of sulfanilamide and the three years after. In the first group the total number was 197, in the second 200. Of the first group 43.1 per cent were male, in the second 50.5 per cent; 46 per cent were right in the first group as compared with 56 per cent in the second; 13.7 per cent were chronic in the first group and 25 per cent in the second. In the group preceding sulfanilamide 5.56 per cent had complications, while in the group after the use of sulfanilamide complications appeared in 8 per cent. The mortality in the first group was 3.04 per cent and in the second 3 per cent, about the same. The mortality was found to be caused by meningitis in seven cases, pneumonia in one case, following spinal puncture in one case, septicemia one, petrositis and meningitis one and myelogenous leukemia one. Having found these statistics for Atlanta, I then converted them into death rates per hundred thousand of population for comparison with the United States Bureau of Vital Statistics, which figures are for the United States as a whole. They are 1.3, 1.2, 1.3, 1.6, 1.3 for the first group, which puts the assumed Southeast in a class of about average mortality, but in the first two years of the second group Atlanta's mortality was about twice as high as the average for the country as a whole. In 1939, however, for which I do not have a bureau figure, the mortality has dropped to less than one half. From these statistics it would seem that the geographic virulence of mastoiditis as regards the Southeast is slightly higher than an average for the United States as a whole.

DR. MERCER G. LYNCH, New Orleans: Throughout the country the anatomy of the mastoid doesn't vary. The methods of treatment of acutely and chronically inflamed ears do not vary to any great extent. Therefore, another problem enters into the question as to why there should be so much more mastoiditis in one part of the country as compared to another with regard to population, and because of this an attempt has been made to study the virulence of the organism with the idea in mind that, all factors being equal, it was the virulence of the organism that contributed to a great extent to the increase of mastoiditis throughout the country.

REHABILITATION FOLLOWING ACUTE CORONARY ARTERY OCCLUSION

ARTHUR M. MASTER, M.D.
AND
SIMON DACK, M.D.
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It is only during the past decade or two that the clinical recognition of coronary occlusion has become well established among general practitioners. There has therefore been a limited period for follow-up study of patients recovering from the acute attack, and of necessity relatively little accurate information is available concerning the future course of the disease. This is true particularly concerning the degree of economic restitution following an attack.

Since coronary occlusion is very common,[1] occurring in all strata of society, it is of importance from a therapeutic and prognostic standpoint for a physician to know whether the patient may return to work. Many questions concerning the effect of work following coronary occlusion have remained unanswered. For example, does work increase the susceptibility to further attacks of occlusion, to death, to heart failure, to angina pectoris? If angina pectoris is present, should the patient be permitted to work? Does the presence of a slight degree of heart failure preclude the possibility of working? There is wide variation of opinion concerning the answers to these questions. Formerly it was commonly believed that coronary occlusion always entailed complete and permanent disability, and even now millions of dollars are paid annually by insurance companies to men who have suffered a coronary occlusion, regardless of their present physical condition. However, a number of authors [2] including ourselves [3] have recently pointed out not only that the immediate prognosis of coronary occlusion is steadily improving but that the patient may recover completely and remain in good health for many years. Furthermore, one of us showed that many patients recovering from the acute attack returned to work. The first complete report [4] on this subject, comprising seventy-five cases followed in private practice, showed that at least 62 per cent of the patients returned to their usual routine of life or work and that 14 per cent resumed light to moderate activity. Only 8 per cent of the patients were completely disabled. Other authors [5] have subscribed to our point of view.

From the Cardiographic Laboratory and the Medical Services of the Mount Sinai Hospital.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Master, A. M.; Jaffe, H. L., and Dack, Simon: The Prevalence of Coronary Artery Occlusion, New York State J. Med. **39:** 1937 (Oct. 15) 1939.

2. Conner, L. A., and Holt, Evelyn: The Subsequent Course and Prognosis in Coronary Thrombosis: An Analysis of 287 Cases, Am. Heart J. **5:** 705 (Aug.) 1930. Coombs, C. F.: Prognosis in Coronary Thrombosis, Bristol Med.-Chir. J. **49:** 277, 1932. Mullins, W. L.: Age Incidence and Mortality in Coronary Occlusion: A Review of Four Hundred Cases, Pennsylvania M. J. **39:** 322 (Feb.) 1936. White, P. D.: Immediate and Ultimate Prognosis in Heart Disease, J. A. M. A. **112:** 2380 (June 10) 1939. Willius, F. A.: Life Expectancy in Coronary Thrombosis, ibid. **106:** 1890 (May 30) 1936.

3. Master, A. M.; Jaffe, H. L., and Dack, Simon: The Treatment and Immediate Prognosis of Coronary Artery Thrombosis (267 Attacks), Am. Heart J. **12:** 549 (Nov.) 1936. Master.[4]

4. Master, A. M.: Coronary Artery Thrombosis, with Treatment by Prolonged Rest in Bed and Low Calory Diet: Improved Prognosis, J. A. M. A. **105:** 337 (Aug. 3) 1935.

5. Parkinson, J., and Bedford, D. E.: Cardiac Infarction and Coronary Thombosis, Lancet **1:** 4 (Jan. 7) 1928. Cooksey, W. R.: Coronary Thrombosis; Follow-Up Studies with Especial Reference to Prognosis, J. A. M. A. **104:** 2063 (June 8) 1935. Lewis, W. H., Jr.: Coronary Occlusion: Report of Unusual Activities After Recovery, ibid. **114:** 484 (Feb. 10) 1940. White.[2]

This follow-up study consists of a much larger series of cases. It concerns itself not only with the problem of how many return to work but also with factors which favor economic restitution.

MATERIAL

The series consists of 415 patients, 185 private and 230 hospital ward, who had sustained an acute coronary occlusion and had survived the acute attack [6] (table 1). Detailed information concerning these patients' activities following the attack was obtained by the questionnaire reproduced here. Many of the private patients were also seen frequently at the office and practically all the ward patients were observed in a special follow-up clinic.

WORK QUESTIONNAIRE

Name: Age: Date of Attack:

1. What kind of work, if any, did you do before your illness?
2. Have you done any work since your illness?
3. If you have not worked is it because:
   (a) you were advised not to (if so, by whom)?
   (b) you are receiving sickness or disability insurance?
   (c) you have been unable to find a job?
   (d) you are unable to work?
   If you are unable to work, what is the reason?
4. If you have worked:
   (a) How soon after you left the hospital did you return to work?
   (b) What kind of work have you been doing?
   (c) Are you able to work full time? Part time?
   (d) If you are not able to work full time, what is the reason?
   (e) Do you find it difficult to work? If so, why?
5. Have you any disability insurance from which you could receive benefits if you could not work?

There were 342 males and seventy-three females. Seventy-five per cent of the patients had suffered one attack, 22 per cent a second attack and the remainder a third or fourth attack when they first came under our observation. Two fifths of the patients were in the sixth decade of life and the majority of the remainder were in the fifth and seventh decades.

TABLE 1.—*Summary of 415 Attacks*

	Private	Ward	Total
Total cases	185	230	415
Sex: Male	146	196	342 (82%)
Female	39	34	73 (18%)
One attack	157	155	312 (75%)
Two attacks	26	64	90 (22%)
Three and four attacks	2	11	13 (3%)
Age groups:			
30-39	4	21	25 (6%)
40-49	48	58	106 (30%)
50-59	63	101	164 (40%)
60-69	50	43	93 (22%)
70-89	20	7	27 (6%)

TABLE 2.—*Period of Follow-Up After Recovery from Attack*

Period	Private	Ward	Total
6 months or less	14	28	42 (10%)
6 to 12 months	41	26	67 (16%)
1½ years	9	16	25 (6%)
2 years	19	52	71 (17%)
3 years	26	52	78 (19%)
4 years	20	32	52 (13%)
5 years	22	18	40 (10%)
6 years	10	6	16 (4%)
7 years	9	0	9 (2%)
8 to 15 years	9	0	9 (2%)
Unknown	6	0	6 (1%)
	185	230	415

The longest period of observation was fifteen years and the average about three years (table 2). Eighty patients were followed five years or more.

All types of occupation and all strata of society were represented (table 6). It will be noted that more than 50 per cent of the ward patients were manual workers or laborers, while these occupations composed only 11 per cent of the private group.

TABLE 3.—*Effect of Age*

Age Groups	No. of Cases	Return to Work: Full	Part	Total
30-39	35	14	5	19 (70%)
40-49	106	40	23	63 (59%)
50-59	164	50	37	87 (53%)
60-69	94	22	18	40 (43%)
70-89	27	6	6	12 (44%)
Total	415	132 (32%)	89 (21%)	221 (53%)

TABLE 4.—*Influence of Sex and Social Status*

Sex	No. of Cases	Return to Work: Full	Part	Total
Private				
Male	146	71	17	88 (60%)
Female	39	7	11	18 (46%)
Total	185	78	28	106 (57%)
Ward				
Male	196	51	45	96 (49%)
Female	34	3	16	19 (56%)
Total	230	54	61	115 (50%)
Total				
Male	342	122	62	184 (54%)
Female	73	10	27	37 (51%)
Total	415	132	89	221 (53%)

The following points were considered: the percentage of patients returning to work; whether the patient experienced any symptoms of impaired cardiac reserve during work; the influence of age, sex, number of attacks sustained and occupation on the incidence of return to work; the time of return to work; the reasons for not resuming work; the incidence of further attacks of occlusion, and the mortality rates of those who returned to work as compared with those who did not.

RESULTS

Fifty-three per cent of all patients returned to work following recovery from the attack; these included 57 per cent of private patients and 50 per cent of ward patients. In 32 per cent the work was full time and in 21 per cent part time (table 3). In general, the private patients fared better than the ward, the degree of economic restitution being greater in the former group (table 4). Thus 42 per cent of private patients resumed full time work, whereas only 23 per cent of the ward patients did so.

The factor of greatest importance in determining return to work was the age of the patient (table 3). The younger the patient the more probable is his return to work. Thus 75 per cent of those in the fourth decade and only 43 per cent of those in the seventh resumed their occupation. This is not surprising, since even in the general population the incidence of those in gainful employment probably decreases with age.

Sex was no factor in influencing return to work (table 4), for almost as many women (51 per cent) resumed their former activities as did men (54 per cent).

The second most important factor was the number of attacks of occlusion sustained by the patient (table 5). It is well known [3] that the immediate prognosis, including the mortality rate, of an initial attack is better than

6. Of 857 patients with acute coronary occlusion observed during the past ten years, 662 survived the acute attack. Of these, 247 were lost from observation or had sustained their attack too recently to be available for study, leaving a total of 415 cases, which form the basis for this report.

that of a second or third attack. Similarly the percentage of patients returning to work after a first attack exceeded by far that of patients who had sustained a second or third attack, the percentages being 59, 38 and 23 respectively. It is noteworthy that one man resumed his occupation after a fourth attack.

TABLE 5.—*Influence of Successive Attacks*

Attack	No. of Cases	Return to Work		
		Full	Part	Total
1.	312	113	71	184 (59%)
2.	90	17	17	34 (38%)
3 and 4.	13	2	1	3 (23%)
Total.	415	132	89	221 (53%)

Previous occupation played some role in determining return to work (table 6). Thus 84 per cent of professional persons, particularly physicians, and 67 per cent of white collar and office workers resumed their occupation, whereas only from 50 to 55 per cent of the remaining groups did so. Only occasionally did a patient take up a more sedentary occupation but not infrequently he did only light work. This was true chiefly among manual workers and laborers; more than half of those who resumed work did so on only part time, whereas almost all the professional persons and office workers worked full time. However, this discrepancy may be explained in part by the fact that the professional and executive classes are able to lighten their activities although they seem full time and are so described.

TABLE 6.—*Influence of Occupation*

Occupation	No. of Cases	Return to Work		
		Full	Part	Total
Private				
1. Workers and laborers	20	8	3	11
2. Store workers	11	5	2	7
3. White collar and office workers	18	11	2	13
4. Business men	26	14	2	16
5. Professional persons	38	28	7	35
6. Housewives	31	6	10	16
7. None or retired	11	0	0	0
8. Unknown	30	6	2	8
Total	185	78	28	106 (57%)
Ward				
1. Workers and laborers	123	28	36	64
2. Store workers	13	2	3	5
3. White collar and office workers	33	14	6	20
4. Business men	9	3	0	3
5. Professional persons	11	4	2	6
6. Housewives	32	3	14	17
7. None or retired	9	0	0	0
Total	230	54	61	115 (50%)
Total				
1. Workers and laborers	143	36	39	75 (53%)
2. Store workers	24	7	5	12 (50%)
3. White collar and office workers	51	25	8	33 (67%)
4. Business men	35	17	2	19 (55%)
5. Professional persons	49	32	9	41 (84%)
6. Housewives	63	9	24	33 (52%)
7. None or retired	20	0	0	0
8. Unknown	30	6	2	8 (26%)
Total	415	132	89	221 (53%)

It will be seen in table 6 that twenty patients had no occupation or were retired prior to the attack. Although we have included all these patients in the group that did not return to work, it should be noted that only a few were invalids or bedridden. The majority were able to carry on the ordinary activities of daily life.

In table 7 we have tabulated the time of return to work following discharge from the hospital or after getting out of bed (usually a four to eight week period). Of the 169 patients for whom this could be determined, 92 per cent resumed work within one year, 76.5 per cent within six months and 54 per cent within three months of discharge. Ten patients continued working through the entire attack, the diagnosis of coronary occlusion being made later on the basis of history and changes in the electrocardiogram.

Although the majority of patients resumed work, almost half of these experienced some degree of pain, dyspnea or weakness during work (table 8). Ward patients predominated among these, particularly housewives, laborers and white collar workers. However, the symptoms were not severe enough to keep them from their ordinary activities. It should be remembered that in 50 per cent or more of these cases similar symptoms were probably present prior to the attack of coronary occlusion.

Inability or failure to return to work (table 9) was usually due to physical disability, the particular complaints being angina pectoris, weakness or dyspnea. Heart failure was also common. A large group of patients did not work because they were advised against it by their physicians. It seemed to us that a large percentage of this group could have worked if it had been necessary. Many patients held disability insurance, particularly in the private group. Twenty-eight of the latter and two ward patients gave this as the sole reason for not returning to work. Not a few patients felt well enough to resume their occupations despite the disability insurance they held. Several patients did not work because it was no longer necessary for them to do so or because of inability to find a job.

TABLE 7.—*Time of Return to Work After Attack*

	Private	Ward	Total
Never stopped	10	0	10 (6%)
3 months or less	41	40	81 (48%)
3-6 months	20	18	38 (22.5%)
6-12 months	7	19	26 (15.5%)
1-2 years	1	9	10 (6%)
2-3 years	0	2	2 (1%)
4 years	0	1	1 (0.5%)
6 years	1	0	1 (0.5%)
Total	80	89	169
Unknown	26	26	52
	106	115	221

An attempt was made to determine the influence of return to work following coronary occlusion in predisposition to a further attack or to congestive failure by comparing the incidence of these in the group that worked and in the one that did not (table 10). One difficulty in doing this is the fact that the nonworkers included a large number of very sick patients. Nevertheless it is evident that the number of subsequent attacks was no greater in the working group than in the nonworking group. This is true also of the number of patients who developed congestive heart failure or who died subsequent to the acute attack. It appears, therefore, that return to work following recovery from the attack did not adversely influence the occurrence of further attacks of coronary occlusion or of heart failure.

COMMENT

Not only has there been improvement in the immediate prognosis of the acute attack of coronary occlusion [3] but our present observations indicate also quite definitely that the outlook for the future is hopeful for the patient who survives the attack. We have found

that approximately half the number of patients are able to resume their former occupations within one year, and usually in less than six months. To be sure, many of those who return to work complain of angina, dyspnea or weakness, but these symptoms are usually mild and frequently no more severe than they were prior to the attack.

We have observed many of these patients at regular intervals and have gained the distinct impression that, as a rule, their symptoms were not directly connected with the fact that they were employed but would have been present in any case. Only occasionally has it been our experience that symptoms would develop while a patient was employed which would disappear when he gave up his job. Usually the symptoms persisted. It would seem that, following coronary occlusion, patients may be placed in two general groups. One includes those who recover quite well and can resume their usual mode of life although they may have some complaints. The great majority of this group are patients below the age of 50 who have sustained only one attack of coronary occlusion. In the other group are those who never completely recover from the occlusion but are left with a persistent anginal syndrome or evidence of heart failure. The latter patients are unable to return to work whereas the former are not only able to do so but are usually

TABLE 8.—*Symptoms on Return to Work*

Occupation	Working	Symptoms *
1. Workers and laborers	75	48
2. Store workers	12	4
3. White collar and office workers	33	16
4. Business men	19	6
5. Professional men	41	6
6. Housewives	33	23
7. None or retired	0	0
8. Unknown	8	1
Total	221	104 (47%)

* Angina pectoris, dyspnea, weakness.

unaffected by the effort, even though it is frequently no less arduous than that sustained prior to the attack.

It is our opinion also that return to work is not a factor in the occurrence of further attacks of coronary occlusion. We have already presented evidence[7] in 1,500 attacks of coronary occlusion that the onset is not related to any external factor or to any particular occupation or social class. Coronary occlusion is the end result of a progressive atherosclerotic process and occurs as often in the sedentary individual as in one engaged in active work. In the present series the incidence of further attacks of coronary occlusion or heart failure in those who return to work was not unduly large and was not greater than in those who remained invalids or led a sedentary life. Similarly the number of deaths was not higher.

It is obvious from our observations that sustaining an occlusion of a coronary artery is in itself no reason for permanent disability. Indeed, frequently the temporary disability does not extend beyond from three to six months, and the patient can return to his previous occupation. If the work is strenuous, such as manual labor or factory work, a thorough examination before return to it and periodically thereafter is essential in order to be certain that the condition of the heart is satisfactory. In such an occupation one faces the problem of compensability if another occlusion occurs or heart failure sets in, but we have already indicated our belief that these occur irrespective of occupation.

The indications of disability following coronary occlusion are similar to those in any case of coronary

TABLE 9.—*Reasons for Failure to Work*

	Private	Ward	Total
Unable	26	68	92 *
Advised not to	16	36	52
Disability insurance	28	2	30
Not necessary to work	6	0	6
No job	1	5	6
Too recent	1	3	4
Unknown	3	1	4
Total	79	115	194

* Twenty of these patients were unable to work prior to the attack.

artery disease. These are chiefly the presence of heart failure or a severe anginal syndrome, particularly at rest or during habitual activity. Occasionally extreme weakness may be persistent as the only symptom of disability. A history of recurrent occlusion, especially in association with aneurysm of the heart, is a legitimate reason for disability, although even such patients sometimes carry on comfortably. The same is true of patients whose blood pressure is very much elevated. Even in the presence of these indications of disability it may yet be advantageous to permit some degree of activity, since it may be tolerated without adverse effect and may benefit the patient psychologically. Invalidism has too long been emphasized in heart disease, and a hopeful outlook on the part of the physician may guide the patient into a useful and enjoyable life.

SUMMARY AND CONCLUSIONS

A follow-up study after coronary occlusion was made to determine the incidence and degree of economic restitution and the various factors influencing the latter.

Four hundred and fifteen patients were followed for from six months to fifteen years after the attack. There were 185 private and 230 ward patients of all ages, occupations and walks of life.

More than half the patients returned to work on full or part time. Half of this group resumed work within three months of discharge, three fourths within six months and nine tenths within one year.

The percentage of patients returning to work was higher in the younger age groups, particularly those under 40, and in those recovering from an initial attack. The percentage was about the same in males and females.

The professional and white collar classes resumed their work more frequently than did persons engaged in other occupations.

The chief cause of failure to return to work was physical disability resulting from angina pectoris, dyspnea or weakness. Other reasons were advice not to work and disability insurance.

TABLE 10.—*Relation of Work to Further Attacks*

	Patients Who Worked			Patients Who Did Not Work		
	Private	Ward	Total	Private	Ward	Total
Number	106	115	221	79	115	194
Subsequent coronary occlusion	16	9	25	18	22	40
Subsequent death	18	6	24	24	20	44
Subsequent heart failure	..	9	9	..	22	22

7. Master, A. M.; Dack, Simon, and Jaffe, H. L.: The Relation of Various Factors to the Onset of Coronary Artery Thrombosis, J. Mount Sinai Hosp. **3**: 224 (Jan.-Feb.) 1937; Factors and Events Associated with the Onset of Coronary Artery Thrombosis, J. A. M. A. **109**: 546 (Aug. 21) 1937; The Precipitating Factors of Coronary Artery Occlusion, Indust. Med. **8**: 327 (Aug.) 1939; Activities Associated with the Onset of Acute Coronary Artery Occlusion, Am. Heart J. **18**: 434 (Oct.) 1939.

About half the patients who returned to work complained of pain, dyspnea or weakness which were not of sufficient degree to cause disability. It is our impression that the work did not aggravate these symptoms or predispose the patient to them or to further attacks of coronary occlusion or heart failure.

An attack of acute coronary occlusion in itself is not sufficient reason for permanent disability. Complete recovery and full or partial economic restitution are common. Heart failure or a severe anginal syndrome is evidence of complete disability.

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ABSTRACT OF DISCUSSION

DR. HARRY E. UNGERLEIDER, New York: Our increased knowledge of heart disease in recent years has brought a more encouraging outlook. It is a far cry from individual case reports of recovery from coronary occlusion which were cited in the literature a decade ago to the hopeful prognosis for the majority revealed by the authors' study. While a relatively optimistic view toward coronary occlusion now prevails among cardiologists there continues to be an unwarranted dread of this disease. The feeling is widespread among the laity and also with the medical profession that an individual who has sustained an attack of coronary thrombosis is "through" and is doomed to spend his remaining days in complete invalidism. Studies such as the present one should dispel this erroneous concept, which has caused needless fear and unhappiness to thousands of individuals with this common disease. Apart from this problem as it applies to the management of individual cases there are two important aspects, the relation of coronary disease to industry as regards industrial law and the subject of disability insurance. There is a deplorable lack of uniformity in different states in the legal attitude toward the responsibility of industry to employees with heart disease regarding both employability and compensation. There is a reluctance on the part of industry to accept for employment individuals known to have heart disease because of possible liability for subsequent illness. In fairness to both parties, it would be advisable to have subjects with heart disease sign waivers removing liability for further complications. It is hoped that this important subject, which has been largely neglected by the medical profession, will receive the consideration it richly deserves and will result in some uniformity of procedure which is now wofully lacking. The subject of disability insurance is of great practical importance. Coronary thrombosis is no longer regarded in itself as cause for total and permanent disability unless there is some residual impairment of cardiac function such as angina or evidence of heart failure. Insurance companies for years have carried out a rehabilitation program in cases of coronary thrombosis. Following a temporary period of total disability after the attack a cooperative attempt is made to restore the subject to his previous occupation or another less strenuous, and disability payments are continued until it is definitely ascertained whether work can be continued. This program has proved most satisfactory to both the insured party and the company, and in a large number of cases the psychologic effects of invalidism, often worse than the disease itself, have been successfully averted. It should be a primary objective in the treatment of coronary thrombosis to make definite efforts to avoid invalidisms instead of instilling needless fear and restrictions, as has been our practice too often in the past.

DR. CARY EGGLESTON, New York: I think we have been too long afraid to permit our patients, after a coronary occlusion, to attempt rehabilitation. We have ben misled partly by our own fear but chiefly by the patient's fear, which has been instilled in many by physicians who have had too little experience with the ultimate outcome in these cases. We ought to about face in our treatment of these patients and make it the primary goal to tide them through the attack with an eye to their rehabilitation. A great deal of the disability residual in some of these patients who do not work is purely a psychic disability. Where conditions in such patients alter from circumstances without, over which they have no control, a number of these patients who previously were unable or believed themselves unable to work have successfully resumed occupation on a satisfactory or economic level. We must lay greater emphasis on rehabilitation. As a profession we owe a duty to ourselves to educate our brothers in the recoverability from coronary occlusion.

DR. CLIFFORD KUH, New Haven, Conn.: Yesterday at the General Scientific Meeting in discussing the management of patients with heart failure Dr. Samuel A. Levine mentioned that sometimes we are a little fearful in treating them. In one case of coronary thrombosis when other measures failed he got the man well by getting him out of bed and into a chair. I think the point is a significant one to bring out here, namely that we might be fearful not only in our after-care but in our therapeutics. In this case the man had congestive failure with hydrothorax. By getting him in a chair the edema was thrown to the extremities. This relieved respiration and the man did very well.

OCCIDENTAL BERIBERI WITH CARDIOVASCULAR MANIFESTATIONS

ITS RELATION TO THIAMIN DEFICIENCY

SOMA WEISS, M.D.

BOSTON

In 1936 we [1] described the existence of "wet" beriberi with cardiovascular disturbances as a nutritional disease of regular occurrence in Boston and its vicinity. We presented evidence indicating that this disease is related to vitamin B deficiency and that administration of thiamin chloride or vitamin B concentrate benefits patients with this condition. Since this first report, further studies have been conducted on the clinical, physiologic and chemical characteristics of beriberi and on its treatment.[2] We have induced cardiac disturbances in animals fed on a thiamin-deficient diet and demonstrated that their cardiac disturbances disappeared promptly following the administration of thiamin chloride.[3] We have investigated the metabolism of the myocardium in vitamin B_1 deficiency [4] and made a systematic search to evaluate the role of certain intermediary metabolic products, such as lactic acid, pyruvic acid, methyl glyoxal, glyceraldehyde and adenylic acid, in the induction of cardiac disturbances.[5] In the light of these and more recent observations, as well as of reports of other investigators, it may be of interest to summarize the present status of our knowledge of "Occidental beriberi" with cardiovascular manifestations.

Read in part before the Eighth American Scientific Congress, Washington, D. C., May 13, 1940.

From the Medical Clinic of the Peter Bent Brigham Hospital, the Boston City Hospital and the Department of Medicine, Harvard Medical School.

Since this article was written, the term "thiamine hydrochloride" has been adopted as the Pharmacopeial name for the substance referred to here as thiamin chloride.

1. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Vitamin Deficiency States, Tr. A. Am. Physicians **51**: 341, 1936.

2. Taylor, F. H. L.; Weiss, Soma, and Wilkins, R. W.: The Bisulfite Binding Power of the Blood in Health and in Disease, with Special Reference to Vitamin B_1 Deficiency, J. Clin. Investigation **16**: 833 (Nov.) 1937. Wilkins, R. W.; Weiss, Soma, and Taylor, F. H. L.: Relationship of Pyruvic Acid to the Bisulfite Binding Substances of the Blood, Proc. Soc. Exper. Biol. & Med. **38**: 296 (March) 1938; The Effect and Rate of Removal of Pyruvic Acid Administered to Normal Persons and to Patients With and Without "Vitamin B Deficiency," Ann. Int. Med. **12**: 938 (Jan.) 1939. Weiss and Wilkins.[2]

3. Weiss, Soma; Haynes, F. W., and Zoll, P. M.: Electrocardiographic Manifestations and the Cardiac Effect of Drugs in Vitamin B_1 Deficiency in Rats, Am. Heart J. **15**: 206 (Feb.) 1938.

4. Muus, Jytte; Weiss, Soma, and Hastings, A. B.: Tissue Metabolism in Vitamin Deficiencies: II. Effect of Thiamine Deficiency, J. Biol. Chem. **129**: 303 (July) 1939.

5. Haynes, F. W., and Weiss, Soma: Responses of the Normal Heart and the Heart in Experimental Vitamin B_1 Deficiency to Metabolites (Pyruvic Acid, Lactic Acid, Methyl Glyoxal, Glyceraldehyde and Adenylic Acid) and to Thiamin, Am. Heart J. **20**: 34 (July) 1940.

EVIDENCE FOR THE EXISTENCE OF BERIBERI IN THE UNITED STATES

In the Orient, beriberi is at times a disease of common occurrence and of serious consequence. It may appear as (1) neuritic or "dry" beriberi with symptoms and signs related to the nervous system; (2) the edematous or "wet" type in which the clinical picture consists mainly of diffuse dependent and nondependent edema, quite similar in distribution to that seen in glomerulonephritis, toxemia of pregnancy and nephrosis, with the serous cavities, including the pericardium, often containing varying amounts of fluid; (3) the cardiac type, which in its pronounced form may be associated with high venous pressure and dilatation of the heart. The clinical reports from the Orient emphasize the fact that "mixed types," i. e. combinations of the various manifestations of beriberi, are common.

It is essential to appreciate the fact that in many of the older clinical reports of cases of beriberi the cardiac size was determined only with the aid of percussion and hence is unreliable. Aalsmeer and Wenckebach,[6] on the basis of their studies of beriberi in Java, state that dilatation and failure of the right ventricle characterize this type of heart disease and that the circulatory failure is "right sided failure." Wenckebach [7] postulated that the blood flow is relatively rapid in beriberi with heart disease and observed that the symptoms and signs of circulatory failure in beriberi become accentuated after the administration of epinephrine and improved after pitressin. On postmortem examination he observed edema and "hydropic" degeneration of the myocardium.

In the United States, chiefly in the publications of Shattuck,[8] Wechsler [9] and Minot, Strauss and Cobb,[10] it has been suggested that in the etiology of certain types of polyneuritis, including alcoholic polyneuritis, nutritional deficiency and lack of vitamin B_1 play a role. Our establishment subsequently of the occurrence of "wet" beriberi in the same nutritional disorders added evidence to support the claim that these polyneuritides are of the same etiology as the polyneuritis of "dry" beriberi in the Orient.

In our earlier studies we compared the clinical, physiologic and morphologic characteristics of the disease with those observed in the Orient. Both the clinical studies [11] and subsequent experiences revealed that the same types of beriberi described in the Orient exist in this country. Thus we have reported cases presenting severe polyneuritis and electrocardiographic changes, tachycardia and a normal size heart; polyneuritis and severe congestive failure of the heart associated with electrocardiographic changes but with a normal size heart; and a severe degree of dilatation of the heart with little or no electrocardiographic changes, associated with a moderate or severe degree of edema. We found that the type of circulatory failure in "wet" beriberi might be either right or left sided or both. In addition to the clinical picture of right ventricular failure described by Aalsmeer and Wenckebach, orthopnea, cardiac asthma, x-ray and clinical signs of pulmonary congestion and edema were also observed. The onset of symptoms might be either gradual or quite sudden. Breathlessness, palpitation and tachycardia, gallop rhythm, murmurs and venous congestion, prone to become accentuated on exertion, were present even at rest in the advanced cases, and in these severe cases bounding pulsation of the arteries with "pistol sounds" developed. In some patients bed rest alone resulted in improvement, but in others unexpected accentuation of the circulatory failure and collapse developed at rest, resulting in unexpected death. A strong tendency to circulatory collapse and shock was noted particularly in the presence of respiratory infections. The relative prominence of cardiac or peripheral vascular dysfunction varied considerably. Severe polyneuritis was usually associated only with a mild degree of congestive failure of the circulation, because the presence of such polyneuritis interfered with locomotion and work and hence protected the heart.

The presence of edema, varying in degree from slight to severe, was independent of, though at times influenced by, the protein content of the blood. The edema, while dependent in some instances, was usually diffuse and interstitial. Thus loss of from 40 to 50 pounds (18 to 23 Kg.) of fluid occurred in persons who at first appeared robust and at the time of admission only slightly edematous. As in glomerulonephritis or in toxemia of pregnancy, the protein content of the edema fluid was unusually low. During the edematous stage, oliguria with highly concentrated urine, and at times slightly elevated nonprotein nitrogen of the blood, was present and administration of fluid had little effect on the concentration of urine. Following treatment a continuous maximal diuresis with low specific gravity developed.

The importance of thiamin deficiency in organic heart disease cannot be determined at present, mainly because of the lack of a reliable chemical method for measuring minute amounts of thiamin. As anorexia and unbalanced diet frequently exist in cases of organic heart disease, thiamin deficiency may well accentuate heart failure. We have encountered such cases.[12]

Physiologic studies have indicated that in patients with "wet" beriberi, particularly those with high venous pressures and edema, the arterioles are dilated, the utilization of oxygen in the venous blood is small and the velocity of blood flow is absolutely or relatively rapid. The vital capacity of the lungs is often severely reduced. In some instances, administration of epinephrine temporarily aggravated the condition, while pitressin exerted temporary improvement. In several respects the character of the heart and circulation in "wet" beriberi is similar to that in arteriovenous aneurysm and thyrotoxicosis.

The electrocardiograms often revealed changes, the most common finding being depression and inversion in the T waves and prolongation of the electric systole. At times low voltage of the electrical complexes, premature auricular and ventricular beats and auricular tachycardia developed.

The dietary histories of the patients were usually grossly unbalanced. In the alcoholic group, which in this part of the country represents the majority of cases, the caloric intake was usually high, but the vitamins, especially the B complex, were inadequate. Because beriberi does not develop in all patients consuming the same deficient diet, it is probable that in addition to

6. Aalsmeer, W. C., and Wenckebach, K. F.: Herz und Kreislauf bei der Beriberi-Krankheit, Wien. Arch. f. inn. Med. **16**: 193 (Jan.) 1929.

7. Wenckebach, K. F.: Das Beriberi-Herz, Berlin, Julius Springer, 1934.

8. Shattuck, G. C.: The Relation of Beriberi to Polyneuritis from Other Causes, Am. J. Trop. Med. **8**: 539 (Nov.) 1928.

9. Wechsler, I. S.: Unrecognized Cases of Deficiency Polyneuritis (Avitaminosis?), M. J. & Rec. **131**: 441 (May 7) 1930; Etiology of Polyneuritis, Arch. Neurol. & Psychiat. **29**: 813 (April) 1933.

10. Minot, G. R.; Strauss, M. B., and Cobb, Stanley: "Alcoholic" Polyneuritis; Dietary Deficiency as a Factor in Its Production, New England J. Med. **208**: 1244 (June 15) 1933.

11. Weiss and Wilkins (footnotes 1 and 12).

12. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi), Ann. Int. Med. **11**: 104 (July) 1937.

the diet certain intrinsic bodily factors are involved. At times poor utilization of food substances played a role in the etiology. In addition to chronic alcoholism, peptic ulcer, chronic diarrhea, surgical resection of the intestine, diabetes, pregnancy, thyrotoxicosis, infectious diseases and psychotic aberration ("food cranks") are prone to predispose to the disease.

The acute form of "wet" beriberi is often precipitated by an increase in the requirement associated with a decreased intake of the vitamin B complex, and thiamin in particular. The vitamin requirement is increased in conditions associated with a high metabolic rate, such as fever, thyrotoxicosis, exercise and a high caloric intake of food. For this reason, after the onset of infectious diseases (pneumonia, malaria typhus, typhoid), persons with faulty nutrition and low vitamin B_1 intake but without symptoms ("presymptomatic" or "subclinical" deficiency) are prone to have fulminating beriberi develop following severe exertion. It is probable that the high mortality rate of alcoholic patients suffering from pneumonia depends in part on nutritional deficiencies.

Since the combination of high caloric and low thiamin intake particularly predisposes to the disease, patients with beriberi are often well nourished, as in the case of the polished rice eaters in the Orient or the alcohol consumers of the Occident. Because man seldom chooses or utilizes his food so that it is deficient in only one factor, patients in addition to manifestations of beriberi not infrequently had symptoms and signs of pellagra and less frequently of scurvy, riboflavin and vitamin A deficiencies. No explanation has been found for the predisposition of patients, apparently on the same deficient diet, to "dry" beriberi in one group and to "wet" beriberi in another.

THE ROLE OF ALCOHOL

Alcohol per se is not considered a primary cause of the cardiovascular manifestations for the following reasons: (*a*) Chronic alcoholism is a common occurrence, while beriberi is relatively rare. (*b*) Pharmacologic studies fail to indicate that pure alcohol, without thiamin deficiency, causes cardiovascular damage or polyneuritis. (*c*) Administration of alcohol and thiamin chloride or vitamin B concentrate improves the clinical manifestations. (*d*) Chronic alcoholism is apt to be associated with manifestations of other vitamin deficiencies, such as night blindness, scurvy and pellagra.

It is possible, however, as we have pointed out,[12] that alcohol and other nutritional factors play a secondary predisposing role just as a pure carbohydrate diet predisposes to beriberi. Thus Abderhalden and Wertheimer[13] have demonstrated that, if vitamin B deficient pigeons are fed fatty acids instead of carbohydrates, muscular cramps characteristic of the deficiency do not develop.

The majority of cases of "alcoholic beriberi" occurred among drinkers of whisky and gin, but in a few the condition developed as a result of excessive drinking of beer. The vitamin B content of American beer is low.[14] No instances of beriberi were observed among wine drinkers.

Usually the postmortem studies revealed a moderately or severely dilated heart without coronary or endocardial disease, but in some cases of fatal circulatory collapse the cardiac dilatation was lacking. In other instances, as reported in 1936, there was myocardial hypertrophy and increase in the weight of the heart. Similarly the microscopic examination revealed varied conditions. In several instances no microscopic changes were present. In others "interstitial edema" or, rather, collagen and "hydropic" degeneration, as described by Wenckebach, was noted. Since these changes were observed by us also in other types of heart disease, they are not to be considered as specific of "beriberi heart." The water content of the myocardium was normal regardless of the presence or absence of myocardial "edema,"[1] suggesting that the intercellular material contained a considerable amount of solids.

DIFFERENTIAL DIAGNOSIS

The individual clinical characteristics of the cardiovascular changes in beriberi, as in other cardiovascular diseases, are not specific. Nevertheless the combination of the clinical manifestations, lack of etiology of other types of heart disease and history of unbalanced diet permit a diagnosis with a fair degree of probability. The combined presence of congestive failure of the circulation and a relatively or absolutely increased rate of the circulation rules out several other types of heart failure. The simultaneous presence of other manifestations of nutritional deficiency disease, particularly polyneuritis, gastrointestinal disturbances, pellagroid cutaneous lesions and a tendency to psychosis make the diagnosis probable. Polyneuritis, often only in a mild form, is usually present in "wet" beriberi. The polyneuritic type of beriberi, however, frequently exists without cardiovascular manifestations. It should be remembered, however, that not every obscure myocardial failure without valvular disease is a "beriberi heart." During the past four years, while attempting to select beriberi with cardiac disease, we have been impressed by the relative frequency of other types of heart disease which, like "beriberi heart," are not as yet commonly recognized by physicians. "Beriberi heart" should be differentiated from diseases of the heart associated with arteriovenous aneurysms, thoracic and spinal deformities, rare cases of cirrhosis of the liver, amyloidosis and xanthomatosis, glycogen disease (Van Gierke), pituitary and ovarian disease, glomerulonephritis, idiopathic postpartum myocardial failure, lupus erythematosus disseminatus, scleroderma heart, Boeck's sarcoid, periarteritis nodosa, thrombo-angiitis obliterans, certain respiratory infections, trichinosis, progressive muscular dystrophy and Friedreich's ataxia. The specific characteristics of these and other myocardial diseases not usually recognized have been discussed elsewhere.[15]

The frequency of "beriberi heart" varies considerably, depending on the economic and social level of the population. We have observed more than fifty cases and have collected from hospital records an additional group. In a large charity hospital we noted its occurrence as frequently as once in every 160 medical admissions, but in many of these cases the condition was mild. It is probable that partial deficiencies of thiamin, as determined chemically, will be found to be a relatively frequent nutritional state in this country.

TREATMENT

The response of patients with "wet" beriberi varied considerably. As a rule, patients with "dry" beriberi,

13. Abderhalden, Emil, and Wertheimer, Ernest: Beziehungen des Vitamin B-Komplexes (insbesondere des Vitamins B_1) zum Kohlehydrathaushalt, Arch. f. d. ges. Physiol. **233**: 395, 1933.

14. Donovan, P. B., and Hanke, M. E.: The Vitamin-B and -G Content of Commercial Beer, Proc. Soc. Exper. Biol. & Med. **33**: 538 (Jan.) 1936.

15. Weiss, Soma: Diseases of the Heart and the Aorta Which Are Not Well Recognized, M. Clin. North America **23**: 1323 (Sept.) 1939.

cardiac symptoms and electrocardiographic changes improved slowly over a period of weeks with any type of treatment, while patients with massive edema, dilated heart, high venous pressure and enlarged liver usually responded rapidly, particularly if these conditions had existed but a few weeks. Some of the patients improved following rest alone, others after rest, digitalis and mercurial diuretics. But the maximal and most regular benefit was assured by bed rest and massive subcutaneous doses of thiamin up to 20 or 30 mg. three times a day. The size of these doses was determined empirically, and future studies on the fate, storage and elimination of thiamin must determine the rational dosage. Thiamin and vitamin concentrates are effective orally, but because patients with beriberi often suffer from gastrointestinal and liver disorders which may well interfere with the utilization of thiamin it is advisable to use thiamin chloride parenterally in the severe cases. The duration of the condition and the response of the tissues to the deficiency are probably the major factors determining the time of onset of clinical response, which may vary from several days to several weeks following the institution of therapeutic measures. The fact that the myocardium can develop hypertrophy, "hydropic" degeneration and deposition of interstitial collagen indicates that prolonged thiamin deficiency, like other vitamin deficiencies, can change from an easily reversible to an irreversible condition. Rapid improvement is usually associated with diuresis, temporary bradycardia and transient elevation of the arterial pressure. At times the changes in the electrocardiogram may become temporarily accentuated. Diuresis, less dyspnea and contraction of the peripheral arteriolar system were the early manifestations of improvement. Reduction of the size of the heart and disappearance of the alterations in the electrocardiograms occurred days or weeks later.

In some patients the clinical picture of deficiency and the electrocardiographic changes became accentuated for a day or two after the administration of thiamin, following which general improvement occurred. A similar reaction in animals to experimental thiamin deficiency was observed.

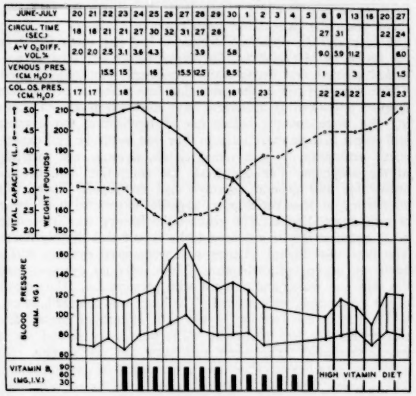
Although we have made no special study of the effect of thiamin chloride on polyneuritis, we have had abundant opportunity to compare clinically the effect of thiamin chloride on the nervous and cardiovascular systems. In our experience the effect of thiamin chloride on the cardiovascular system was more pronounced and more rapid. Indeed, the improvement of polyneuritis of severe type was slow and could not be attributed to thiamin chloride alone. There were, however, a few instances of polyneuritis with paresthesias which, after an adequate control period, responded within a few days to thiamin chloride.

Our observations revealed that thiamin chloride is without effect in cardiovascular disturbances other than those of specific deficiency origin. Similarly, only edema of thiamin deficiency disappears after administration of this substance. Toxic side reactions to the thiamin chloride have not been noted even after intravenous administration in doses up to 75 mg. Because patients with beriberi often have other types of deficiencies, attention should be paid to the simultaneous treatment of pellagra with nicotinic acid and other vitamin B complexes, anemia with iron or liver extract and hemorrhagic tendencies with ascorbic acid or vitamin K.

REPORT OF CASES

Since our last report we have observed a number of additional patients suffering from beriberi with polyneuritis and cardiovascular manifestations. The following three cases are summarized here because they represent different forms of the disease:

CASE 1.—A. D., a white man aged 46, admitted on June 19, 1937, to the Boston City Hospital with swelling of the legs and arms of from two to three weeks' duration, had been a chronic consumer of beer and whisky. Analysis of his diet revealed gross deficiency in vitamins, particularly the vitamin B complex. About three weeks prior to admission his body began to swell and there was slight dyspnea on exertion. About thirteen months earlier the patient had had a similar though milder episode of generalized swelling with dyspnea. There was no history of rheumatic fever, syphilis, hypertension or any other organic heart disease. The rest of his history was irrelevant. On examination he was somewhat disoriented as to time and space. He appeared well developed and well nourished. General anasarca was present involving the face. The fundi of the eyes were normal. The left border of the heart



The response of the cardiovascular system to thiamin chloride in case 1.

was 11 cm. from the sternum in the fifth costal interspace. The heart was regular and rapid. The arteries were soft and the arterial pressure was normal or slightly low. Moist rales were present over the bases of the heart. No abdominal organs were palpated. The scrotum was markedly edematous. The patellar and ankle reflexes were diminished, but the superficial sensation was normal. Until the institution of thiamin therapy the specific gravity of the urine was between 1.026 and 1.030 and the urine contained traces of sugar. The hemoglobin concentration was between 74 and 80 per cent with the red cell count from 3.2 to 4.5 million per cubic millimeter. The white blood cell count was between 5,000 and 7,000. Serologic reaction of the blood for syphilis was negative. The electrocardiogram revealed low voltage: T_1 and T_2 were upright, T_3 was flat and T_4 inverted. There was left ventricular preponderance.

In association with Dr. Robert W. Wilkins special studies were carried out, part of which are presented in the chart. The patient was placed on a "vitamin B" free diet by administering specially boiled milk and fruit juices. As indicated on the chart, during the control period the vital capacity the oxygen utilization and the osmotic pressure of the blood were low. The venous pressure was high but the velocity of blood flow and the blood pressure were normal. Following the parenteral administration of 80 mg. of thiamin chloride daily there was a better utilization of oxygen and a slowing of the blood flow, indicating arteriolar constriction. Within forty-eight hours

after administration of the first dose of thiamin chloride there was symptomatic improvement and diuresis developed. It is of particular interest that this diuresis occurred while the osmotic pressure of the blood and the venous pressure remained unchanged. For a time the vital capacity became even lower, indicating increased pulmonary congestion, while the peripheral edema was improving. Within two or three weeks, however, all manifestations of cardiovascular disturbance disappeared. The patient lost 60 pounds (27 Kg.) of edema and the vital capacity of the lungs rose from 2.2 liters to 5 liters. The specific gravity of the urine was between 1.026 and 1.030 before the onset of diuresis and remained between 1.007 and 1.009 during the ten day period of diuresis. At the same time the maximal diameter of the heart changed from 17.5 cm. to 13 cm. with an unchanged thoracic diameter of 34 cm. Following the administration of thiamin chloride a slight degree of transient hypertension developed. This hypertension, as pointed out before, occurs only in the presence of a copious diuresis and is not caused directly by thiamin, because subsequent administration of thiamin fails to induce it again. The patient was discharged from the hospital as cured.

CASE 2.—*History.*—P. H., a white man aged 31, a laborer, who entered the Boston City Hospital on Oct. 27, 1938, complained of dyspnea and swelling. "My body is all swollen up." For three years the patient had been a heavy consumer of whisky and beer and on numerous occasions had not eaten for days. As stated by his relatives, for weeks before entrance he consumed alcohol and drank soup occasionally but refused food. There were periods in the preceding two years when transient dyspnea and swelling of several days' duration developed. During the three months before his hospitalization the dyspnea and edema became more intense. For one month he had experienced orthopnea, a paroxysmal cough, dyspnea and swelling of the abdomen. For one week the complaints had become unbearable and general anasarca had developed. There was no history of rheumatic fever, syphilis, hypertension or other organic heart disease. The rest of the history was irrelevant.

On examination he appeared to be robust and slightly obese. The face was flushed. There was pronounced dyspnea and a moderate degree of orthopnea. There was no cyanosis, and the skin was warm and covered with perspiration. The vessels of the eyegrounds were normal. The heart was enlarged, 14 cm. to the left of the sternum in the fifth intercostal space. The cardiac impulse was prominent. The pulmonary second sound was accentuated. The heart rate was 120 per minute. No murmurs were heard. There was a protodiastolic gallop rhythm. The arteries were soft. Pistol sounds were heard with each pulsation over the femoral artery. The arterial pressure fluctuated around 90 systolic, 60 diastolic mm. of mercury. No abdominal organs were palpated. Cutaneous sensation was normal. The deep reflexes over the lower extremities were absent. There was a marked degree of generalized edema.

The hemoglobin content was 81 per cent and the red cell count 4.2 million. The white blood cell count was 8,200. Serologic reaction of the blood for syphilis was negative. The nonprotein nitrogen of the blood was 67 and later 56 mg. per hundred cubic centimeters. The carbon dioxide combining power of the blood was 37 volumes per cent. The fasting blood sugar was 100 mg. and the protein 6.3 Gm. per hundred cubic centimeters. The electrocardiogram revealed sino-auricular tachycardia with a rate of 125 per minute. The PR interval was 0.16, the QRS 0.08; T_1 and T_2 were upright, T_3 was inverted and T_4 upright. The QT interval was 0.28. The venous pressure was between 19 and 20 cm. of water and the circulation time thirteen seconds. The dynamics and protein content of the spinal fluid were normal. X-ray examination of the chest revealed an enlarged cardiac shadow with a pronounced degree of congestion of both lungs. The patient was given boiled milk and digitalized within twenty-four hours. The following day the condition remained unchanged. On the evening of October 29 rather unexpectedly the heart rate became faster and early manifestations of circulatory collapse appeared. Twenty mg. of thiamin chloride was administered intramuscularly without avail, and the patient died October 30.

Necropsy.—The lungs were markedly congested. The heart weighed 500 Gm. The myocardium was flabby. All chambers, but particularly the right ventricles, were dilated. The valves, endocardium, pericardium and coronary vessels were normal. Microscopic examination revealed "interstitial edema" between the myocardial fibers, particularly around the vessels. There was increased collagen also. Vacuolization was present in the conduction bundles. All other structures were normal. The other organs, including the kidneys and blood vessels, were normal.

CASE 3.—*History.*—J. D., a white man aged 29, a laborer, who entered the Boston City Hospital Sept. 15, 1939, complained mainly of dyspnea of three days' duration and difficulty with walking for a few weeks previous to his hospital entrance. The patient was a chronic consumer of alcohol and his diet was grossly inadequate in vitamins. He had been in the hospital with acute alcoholism in December 1936 and May 1937. On entrance he was disoriented. He was well developed and well nourished. The head, including the eyegrounds, was normal. There was venous engorgement of the neck. The heart was moderately enlarged to percussion. The rate was 110 and regular. No murmurs were heard. The temperature and respiration were normal. The arterial pressure was 116 systolic, 80 diastolic. There was dulness to flatness with rales over the bases of the lungs. Edema was not present. The rest of the examination was negative except for absence of deep reflexes of the lower extremities. Soon after arrival at the hospital the patient became more disoriented, circulatory collapse developed rather unexpectedly and he died three hours after he had been admitted.

Necropsy.—The heart weighed 560 Gm. The cardiac chambers were moderately distended. The lungs were congested and edematous. Microscopic examination revealed a normal myocardium except for slight edema around the blood vessels and between the muscle fibers. There was slight central hemorrhagic necrosis of the liver. The rest of the gross and microscopic examination of the organs, including the kidneys and blood vessels, was negative.

These three cases are examples of different courses of the disease. The first patient suffered from a severe and acute type of beriberi, characterized mainly by right sided heart failure and changes in the peripheral vascular system. Thiamin chloride induced diuresis of 60 pounds, contraction of the arterioles and return to normal of the cardiac and pulmonary functions. The second patient had chronic thiamin deficiency varying in degree over a period of at least three years. He had suffered from several attacks of mild "wet" beriberi. On admission there was a pronounced degree of heart failure of the right and left sided type. Death due to vasomotor collapse occurred with unexpected rapidity, before thiamin could exert its beneficial effect. The heart was not only dilated but also hypertrophied. The third patient had only a mild degree of heart failure, and fulminating fatal vasomotor collapse developed. Again necropsy revealed dilatation and hypertrophy of the myocardium with interstitial edema, hydropic degeneration and necrosis of some of the muscle fibers. Thus, as reported by us before, chronic "beriberi heart" can result in myocardial hypertrophy.

COMMENT

Conclusive evidence of the existence of beriberi with cardiovascular disturbances in this country lends interest to a study and interpretation of the earlier literature. The question may well be raised as to the clinical interpretation of this disease prior to the discovery of its relation to vitamin deficiency.

So keen a physician as Graham Steell [16] remarked in 1906 of the clinical characteristics of dropsy:

> Capricious distribution of dropsy is specially apt to occur in cases of the cardiac muscle-failure of beer-drinkers and

16. Steell, Graham: Textbook on Diseases of the Heart, Manchester, England, University Press, 1906, p. 18.

of the disease known as beriberi, of both of which diseases, it is curious to note, peripheral neuritis is a clinical feature. . . . Curious special localization of oedema met with, in cases of the kind, have been the scrotum, and together the upper trunk, upper extremities, and scalp and neck, so that oedema simulates that resulting from mediastinal tumour.

I have been told that experienced clinicians in this country have recognized for some time a condition described as "alcoholic myocarditis" and that in the South they were aware that patients with pellagra were poor surgical risks because of the danger of cardiac death and circulatory collapse. In 1924 Magniel [17] described cases of heart disease (le "coeur mou") in association with the consumption of large amounts of alcohol. Patients with this condition had enlarged hearts, gallop rhythm, as a rule obesity and often polyneuritis. May [18] described a similar case in a cook aged 34. Mondon [19] reported a case in which death from delirium tremens occurred at the age of 23, the heart weighing 530 Gm. and interstitial edema being present in the myocardium. In four cases of myocardial disease associated with polyneuritis Hanns and Warter [20] found the etiology to be either obscure or attributable to alcohol. In 1933 Campbell and Allison [21] reported in Ireland a series of eight cases of polyneuritis in which the symptoms of cardiovascular dysfunction were more prominent than the neuritic signs. The nature of these cases is not clear from the report, but the authors raise the question of beriberi. "The cases described here bear some resemblance to the milder types of the disease as it is described in the East. Had these cases been seen in the Orient, it is not improbable that they would have been attributed to that cause. On the other hand, it is open to question whether varied diet of the European could ever become so deficient in vitamin B as to give rise to polyneuritis with cardiac changes." They concluded finally that these cases were probably of an infective rather than of a deficiency origin.

Sporadic instances of heart failure attributed to beriberi in both adults and infants have also been reported in the United States. Kepler [22] observed the occurrence of beriberi as a result of a starch diet. Wohl [23] described the polyneuritic form of beriberi in a young diabetic patient who lived on an unbalanced diet. Scott and Herrmann [24] reported cardiac manifestations of beriberi among rice workers in Louisiana. Riesman and Davidson [25] found beriberi heart in a case after severe voluntary dietary restrictions. In none of the aforementioned publications was the relation of the cardiovascular disturbances to thiamin deficiency appreciated.

Following our investigation reported in 1936, Jones and Sure [26] reported a group of eighteen cases of cardiac insufficiency treated successfully with high vitamin diet and vitamin B_1 concentrate. Hashimoto's case [27] is of interest because there were clinical manifestations of both left and right ventricular failure. In this case administration of thiamin chloride intravenously brought dramatic relief from precordial distress, dyspnea and nausea starting within two or three hours. Improvement was progressive thereafter.

Goodhart and Jolliffe [28] studied eighty-three alcohol addicts who presented no evidence of chronic cardiovascular disease or renal disturbance. Sixty-five patients of this group had symptoms of dietary deficiency, mainly polyneuritis, and 32.3 per cent had electrocardiographic abnormalities. These authors stated that their observations supported the contention that beriberi in all its manifestations is found among alcohol addicts in this country. They estimated that approximately one third of the alcohol addicts who show vitamin B_1 deficiency in the form of peripheral neuritis present clinical evidence of some degree of cardiovascular dysfunction secondary to this deficiency.

Cossio and Moia [29] have reported successful thiamin treatment of cases of beriberi heart occurring in Argentina. In Sweden, Nylin [30] observed instances of beriberi heart with marked congestive failure, which responded to thiamin chloride with prompt improvement. Schultzer [31] reported cases of beriberi heart occurring in Finland. Van Bogaert [32] presented in detail the case of a young person in Belgium who as a result of alcoholic beriberi developed dilated heart, electrocardiographic changes and circulatory failure. Following the administration of thiamin chloride there was rapid improvement and recovery. In Ungley's case in England a young man with pyloric stenosis and peptic ulcer developed dyspnea and edema.[33] The heart was not enlarged, the circulation time was normal, the venous pressure was elevated, the diastolic pressure was low and changes in the electrocardiogram were present. Administration of thiamin chloride was followed by dramatic improvement and disappearance of all the changes. Jones and Bramwell [34] described the occurrence of a classic case of beriberi with severe failure of the circulation in a beer drinker aged 36. Diuresis started twenty-four hours after the administration of thiamin chloride and within two weeks practically all symptoms and signs had disappeared. Yudkin [35] studied a case of "wet" beriberi with cardiac manifestations in a man aged 25 whose diet consisted mainly of polished rice. The administration of thiamin chloride effected rapid improvement.

Langeron reported the occurrence of beriberi with cardiac manifestations in France [36] and discussed the

17. Magniel, Maurice: Le "coeur mou," Arch d. mal. du cœur **17:** 749 (Dec.) 1924.
18. May, Etienne: Un cas d'insuffisance primitive du ventricule gauche à forme pleurale, Bull. et mém. Soc. méd. d. hôp. de Paris **49:** 432 (March 20) 1925.
19. Mondon, H.: Pancréatite hémorragique: Infarctus mésentérique et myocardie chez un éthylique, Bull. et mém. Soc. méd. d. hôp. de Paris **53:** 542 (May 13) 1929.
20. Hanns, Alfred, and Warter J.: Myocardite étylique, Arch. d. mal. du cœur **26:** 391 (June) 1933.
21. Campbell, S. B. B., and Allison,, R. S.: Electrocardiographic Changes in Toxic Polyneuritis, Lancet **2:** 410 (Aug. 19) 1933.
22. Kepler, E. J.: Beriberi from a Diet of Raw Starch, J. A. M. A. **85:** 409 (Aug. 8) 1925.
23. Wohl, M. G.: Avitaminosis in the Course of Diabetes: Occurrence in a Case, with Symptoms and Lesions of Beriberi Predominating, J. A. M. A. **87:** 901 (Sept. 18) 1926.
24. Scott, L. C., and Herrmann, G. R.: Beriberi ("Maladie des Jambes") in Louisiana, with Especial Reference to Cardiac Manifestations, J. A. M. A. **90:** 2083 (June 30) 1928.
25. Riesman, David, and Davidson, H. S.: Beriberi Following Drastic Voluntary Dietary Restriction, J. A. M. A. **102:** 2000 (June 16) 1934.
26. Jones, W. A., and Sure, Barnett: The Rôle of Vitamin B_1 in Cardiovascular Diseases, J. Lab. & Clin. Med. **22:** 991 (July) 1937.
27. Hashimoto, Hirotoshi: Acute Pernicious Form of Beriberi and Its Treatment by Intravenous Administration of Vitamin B_1, with Especial Reference to Electrocardiographic Changes, Am. Heart J. **13:** 580 (May) 1937.
28. Goodhart, Robert, and Jolliffe, Norman: Rôle of Nutritional Deficiencies in the Production of Cardiovascular Disturbances in the Alcohol Addict, Am. Heart J. **15:** 569 (May) 1938. Jolliffe, Norman, and Goodhart, Robert: Beriberi in Alcohol Addicts, J. A. M. A. **111:** 380 (July 30) 1938.
29. Cossio, Pedro, and Moia, B.: Alteraciones cardiovasculares por deficiencia de vitamina B_1, Dia méd. **9:** 1148 (Dec. 27) 1937.
30. Nylin, G.: Avitaminosis-B_1 as a Cause of Cardiac Insufficiency, Nord. med. Tidskr. **15:** 827 (May 21) 1938.
31. Schultzer, Poul: Cardiac Insufficiency and Edema as Sequels of Beriberi, Ugesk. f. læger **101:** 268 (March 2) 1939.
32. van Bogaert, Adalbert: Beriberi alcoolique, Arch. d. mal. du cœur **31:** 1195 (Dec.) 1938.
33. Ungley, C. C.: The Clinical Manifestations of Vitamin B_1 Deficiency, Newcastle M. J. **19:** 43 (April) 1939.
34. Jones, A. M., and Bramwell, Crighton: Alcoholic Beriberi Heart, Brit. Heart J. **1:** 187 (July) 1939.
35. Yudkin, John: A Case of Beriberi Occurring in London, Lancet **2:** 1347 (Dec. 10) 1938.
36. Langeron, Léon: Avitaminose B_1 et insuffisance cardiaque: Le cas de la "myocardie alcoolique" assimilable à un "béribéri nostras," Presse méd. **47:** 1189 (Aug. 2) 1939.

relation of these cases to thiamin deficiency. Bickel [36a] observed cardiac failure as the result of thiamin deficiency among chronic alcoholic addicts and pregnant women in Switzerland. Beneficial response was noted after the administration of thiamin. Dustin, Weyler and Roberts [37] analyzed the electrocardiographic changes in several cases in which there were histories of unbalanced diet and clinical evidence of vitamin B_1 deficiency. Their observations concurred with ours in noting an increase in the duration of the electric systole, rapid rate, tendency to low voltage and in most cases flattening of the T wave in leads 1, 2 and 3. During treatment with thiamin chloride, slowing of the heart rate, increase in voltage and varying changes in the ventricular complexes occurred in all cases.

Williams, Mason and Smith [38] placed four young women on a diet deficient in thiamin for a period of twenty-one weeks. Anorexia, fatigue, loss of weight, absence of or low free gastric acid, constipation and tenderness of the calf muscles developed. Abnormalities in the electrocardiograms developed in all four cases. The amplitude of all complexes decreased and the daily output of thiamin fell to an unusually low average level of 14 micrograms. Within twelve days after the administration of only 4 mg. of thiamin chloride all defects incident to the previous deficiency had disappeared.

In a recent chemical study of the urinary excretion of thiamin in various clinical conditions, Robinson, Melnick and Field [39] observed that in three cases of "alcoholic beriberi," including one of "beriberi heart," the excretion of thiamin was abnormally small. It is of special interest that six of the seven patients with heart failure due to organic heart disease had values indicative of thiamin subnutrition. Likewise it is pertinent that the twenty-four hour urinary thiamin excretion in subjects whose previous dietary intake of thiamin had been adequate, and who ingested an adequate diet on the day of the test, was 90 micrograms or more in all males and more than 60 micrograms in all females but one.

Cardiac complications have been reported in vitamin deficiencies other than thiamin. With the exception of hemorrhagic pericardial effusion in ascorbic acid deficiency, these disturbances should be considered as part of the coexisting beriberi. Thus Feil [40] described electrocardiographic changes in pellagra. Erdheim [41] observed cardiac dilatation and hypertrophy on postmortem examination of thirty-one Viennese children who had died with the clinical picture of scurvy in the famine year of 1918. Meixner [42] observed dilatation and slight hypertrophy of the left ventricle in children suffering from rickets.

EXPERIMENTAL EVIDENCE ON THIAMIN DEFICIENCY AND CARDIAC DYSFUNCTION

The clinical and experimental evidence in man just presented indicates clearly that beriberi, both "dry" and "wet," is a disease of regular occurrence in America as well as in Europe. The two diseases as observed in the Orient and in the Occident are essentially identical. The dietary history and the clinical response to and reduced excretion of thiamin chloride indicate that in the etiology of "beriberi heart" thiamin deficiency is a primary factor. It is possible that other factors contribute to the disease.[43] The relation of thiamin deficiency to heart disease, however, became even more firmly established as a result of recent investigations on animals. In 1930 Drury, Harris and Maudsley [44] observed a slowing of the heart rate in rats fed on diets deficient in vitamin B_1. Pigeons fed on polished rice also showed bradycardia and in some cases heart block.[45] Méhes and Péter,[46] studying the electrocardiograms of rice-fed pigeons, observed that the PR interval was slightly increased and the S and T waves were slightly lower in some of the deficient birds than in the controls. We have studied the effect of thiamin deficiency on rats.[5] In all but four or five of the twenty-two thiamin-deficient animals the decrease in heart rate was accompanied by changes in the electrocardiographic complexes, consisting most frequently of an increase in height, flattening, inversion or high or low take-off of the T waves and depression of the S-T segments. From several hours to a day after the subcutaneous administration of thiamin chloride the electrocardiographic changes disappeared in most instances, although occasionally several days was required. The effect of exercise on thiamin deficiency has been studied on four rats. In these animals, allowed to exercise on the running wheel, the cardiac changes were no more marked, of no different character and in only one instance quicker to develop than in the control, nonexercising, thiamin deficient animals. Epinephrine induced cardiac irregularity in some of the thiamin deficient rats. Administration of atropine and section of the vagus nerves did not abolish the cardiac slowing or the electrocardiographic changes produced by thiamin deficiency. The thiamin deficient animals showed increased sensitivity to the toxic effects of strophanthin as borne out by electrocardiographic changes. In a subsequent study we [5] concluded that the accumulation of intermediary metabolites plays no significant role in the production of cardiac manifestations in thiamin deficient rats. The finding supports the concept that the manifestation of thiamin deficiency depends on a defect in metabolism rather than on a toxic effect of circulatory metabolites. Large doses of thiamin chloride produced no toxic effects and had little if any influence on the heart rate and electrocardiographic complexes of normal rats and dogs. A vagotonic effect of thiamin on the dog heart could not be definitely established.

De Soldati [47] has studied the circulatory disturbances in thirteen thiamin deficient dogs. In 90 per cent the heart rate became markedly elevated and in 70 per cent the arterial pressure fell. In eleven dogs on which

36a. Bickel, Georges: Hypovitaminose B_1 et cardiopathies: Le role de la carence en vitamine B_1 dans la pathogénie des troubles cardiovasculaires des ethyliques chroniques, Arch. d. mal. méd. du cœur **32:** 657 (July) 1939; II. Le role de la carence en vitamine B_1 dans la pathogénie des troubles cardiaques de la gravidité, ibid. **32:** 769 (Aug.) 1939.

37. Dustin, C. C.; Weyler, Henry, and Roberts, C. P.: Electrocardiographic Changes in Vitamin B_1 Deficiency, New England J. Med. **220:** 15 (Jan. 5) 1939.

38. Williams, R. D.; Mason, H. L., and Smith, B. F.: Induced Vitamin B_1 Deficiency in Human Subjects, Proc. Staff Meet., Mayo Clin. **14:** 787 (Dec. 13) 1939.

39. Robinson, W. D.; Melnick, Daniel, and Field, Henry, Jr.: Urinary Excretion of Thiamin in Clinical Cases and the Value of Such Analyses in the Diagnosis of Thiamin Deficiency, J. Clin. Investigation **19:** 399 (March) 1940.

40. Feil, Harold: A Clinical Study of the Electrocardiogram and of the Phases of Cardiac Systole in Pellagra, Am. Heart J. **11:** 173 (Feb.) 1936.

41. Erdheim, J.: Ueber das Barlow-Herz, Wien. klin. Wchnschr. **31:** 1293, 1918.

42. Meixner, K.: Die Erweiterung der linken Herzkammer bei Rachitis, Wien. klin. Wchnschr. **47:** 1273 (Sept. 6) 1928.

43. Meyers, F. M.: Clinical Investigations in Connection with Beriberi: Two Criteria for the Diagnosis of Berberi, Geneesk. tijdschr. v. Nederl-Indië **78:** 1537 (June 28) 1938; Clinical Investigations in Connection with Beriberi with Special Consideration of Edema, ibid. **79:** 3 (Jan. 3) 1939.

44. Drury, A. N.; Harris, L. J., and Maudsley, Cecil: Vitamin B Deficiency in the Rat: Bradycardia as a Distinctive Feature, Biochem. J. **24:** 1632, 1930.

45. Carter, C. W., and Drury, A. N.: Heart Block in Rice-Fed Pigeons, J. Physiol. **68:** 1, 1929. Carter, C. W.: Maintenance Nutrition in the Pigeon and Its Relation to Heart Block, Biochem. J. **28:** 933, 1934.

46. Méhes, J., and Péter, F.: Die wirkung des Digitoxins auf das Ekg. der normalen und der an experimenteller Beriberi erkrankten Tauben, Arch. f. exper. Path. u. Pharmakol. **178:** 226, 1934.

47. de Soldati, León: Los trastornos circulatorios del perro en avitaminosis B_1. I. El pulso, la tensión arterial y el electrocardiograma, Rev. Soc. argent. de biol. **15:** 142 (July) 1939.

electrocardiograms were taken, increased cardiac rate, enlargement of the P waves, changes in the T waves, depression of the S-T segments and prolongation of the Q-T intervals developed. Following administration of thiamin chloride, these changes disappeared. Porto and de Soldati [48] have studied subsequently the myocardium of four thiamin deficient and two control dogs. The thiamin deficient animals revealed dilatation of the right auricle in all cases and in two of the right ventricle. Intercellular edema and vacuolization of the myocardial conductor and ganglionic fibers were observed. The changes observed by these investigators were similar to those described in human beriberi by Aalsmeer and Wenckebach and by us. These changes are not considered by us as specific, for we were able to demonstrate similar changes in other types of heart disease. Swank and Bessey [49] induced cardiac failure in pigeons with thiamin deficiency. They observed that if pigeons were slowly depleted of their thiamin on a partially thiamin deficient diet, and if starvation was prevented by tube feeding, dyspnea developed in from three to six weeks. The electrocardiograms showed changes in the QRS complex and in the T waves, together with tachycardia. Administration of thiamin chloride produced rapid recovery in all but the most advanced cases. Postmortem examination revealed hydropericardium, pulmonary edema and congestion of the lungs and liver. The myocardium of a large percentage of the animals showed focal necrosis. Bradycardia in thiamin deficiency was present only if there was simultaneous starvation. Finally Swank, Porter and Yeomans [50] found that if a diet partially deficient in thiamin chloride is fed to dogs by tube, they may, after from eight to twelve weeks, develop dyspnea and pulmonary rales and exhibit definite abnormalities of the electrocardiogram. If the animals died during the course of this disorder, at postmortem they showed signs of left ventricular failure (pulmonary congestion and edema). The administration of thiamin chloride promptly resulted in great improvement in the circulation in these animals unless they were actually moribund.

CONCLUSIONS

1. Beriberi both with nervous and with cardiovascular manifestations exists in America and in Europe. Whereas in Oriental beriberi polished rice plays a significant predisposing role, alcohol is the calorigenic substance frequently associated with deficient vitamin intake in the Occident.

2. The clinical features and mechanism of "alcoholic" and "nonalcoholic" beriberi are essentially the same. Similarly, no significant difference could be established between "Oriental" and "Occidental" beriberi.

3. The cardiovascular manifestations of beriberi are related to thiamin deficiency, but other factors may play a secondary role.

4. The evidence now available on the causative relation between thiamin deficiency and cardiovascular dysfunction of beriberi is (*a*) thiamin deficiency in the diet, (*b*) decreased thiamin content in the urine, (*c*) disappearance of the disease after the administration of thiamin chloride, (*d*) induction of electrocardiographic changes in healthy men consuming a diet lacking only thiamin chloride, (*e*) induction in animals on a thiamin deficient diet of cardiac disturbances, including cardiac dilatation, electrocardiographic changes, congestive failure of the circulation and structural changes similar to or identical with those observed in man, and (*f*) disappearance of the experimentally induced cardiovascular dysfunction in animals after administration of thiamin chloride.

48. Porto, Jorge, and de Soldati, León: Alteraciones microscópicas del corazón del perro en avitaminosis B_1, Rev. Soc. argent. de biol. **15:** 303 (Oct.) 1939.

49. Swank, R. L., and Bessey, O. A.: The Cardiac Failure in Thiamin Deficient Pigeons (abstract), J. Clin. Investigation, to be published.

50. Swank, R. L.; Porter, R. R., and Yeomans, A.: The Circulatory Effects of Vitamin B_1 Deficiency in the Dog, to be published.

VITAMIN B_6 (PYRIDOXIN) DEFICIENCY IN HUMAN BEINGS

FURTHER STUDIES, WITH SPECIAL EMPHASIS ON THE URINARY EXCRETION OF PYRIDOXIN

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Last year Spies, Bean and Ashe [1] described a syndrome in four persons characterized by "extreme nervousness, insomnia, irritability, abdominal pain, weakness and difficulty in walking," which disappeared dramatically following the intravenous administration of 50 mg. of synthetic vitamin B_6 (pyridoxin). Since this report was published we have observed and treated with identical results twenty similar cases in which there were residual symptoms of nutritional deficiency which could not be relieved with synthetic nicotinic acid, synthetic thiamine hydrochloride or synthetic riboflavin.[2] In order to obtain more evidence concerning this deficiency state in human beings, we have used the method devised by Scudi, Unna and Antopol [3] to investigate the urinary excretion of normal persons taking an adequate diet and of persons with clinical evidence of pellagra, beriberi, riboflavin deficiency and vitamin B_6 deficiency.

MATERIAL AND METHODS

Five normal persons in the laboratory and six patients whose deficiency syndromes were showing clinical improvement were selected as controls. Urine obtained from twelve patients from the Nutrition Clinic of the Hillman Hospital was tested one or more times. These patients had diagnostic evidence of one or more advanced deficiency disease syndromes (nicotinic acid amide nine, pyridoxin four, riboflavin four, thiamine three). Nine of these patients were studied while ambulatory. The other three patients with similar interrelated deficiencies were arbitrarily selected for hospitalization and restricted for three weeks to a deficient diet before any test was done.

The method of Scudi, Unna and Antopol [3] was used to determine the level of pyridoxin in the urine. (It

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From the Department of Internal Medicine, University of Cincinnati College of Medicine, the Department of Chemistry, Carleton College, Northfield, Minn., and the Department of Preventive Medicine, University of Texas Faculty of Medicine, Galveston.

1. Spies, T. D.; Bean, W. B., and Ashe, W. F.: A Note on the Use of Vitamin B_6 in Human Nutrition, J. A. M. A. **112:** 2414 (June 10) 1939.

2. Spies, T. D.; Hightower, D. P., and Hubbard, L. H.: Some Recent Advances in Vitamin Therapy, J. A. M. A. **115:** 292 (July 27) 1940.

3. Scudi, J. V.; Unna, Klaus, and Antopol, William: A Study of the Urinary Excretion of Vitamin B_6 by a Colorimetric Method, unpublished observations.

relation of these cases to thiamin deficiency. Bickel [36a] observed cardiac failure as the result of thiamin deficiency among chronic alcoholic addicts and pregnant women in Switzerland. Beneficial response was noted after the administration of thiamin. Dustin, Weyler and Roberts [37] analyzed the electrocardiographic changes in several cases in which there were histories of unbalanced diet and clinical evidence of vitamin B_1 deficiency. Their observations concurred with ours in noting an increase in the duration of the electric systole, rapid rate, tendency to low voltage and in most cases flattening of the T wave in leads 1, 2 and 3. During treatment with thiamin chloride, slowing of the heart rate, increase in voltage and varying changes in the ventricular complexes occurred in all cases.

Williams, Mason and Smith [38] placed four young women on a diet deficient in thiamin for a period of twenty-one weeks. Anorexia, fatigue, loss of weight, absence of or low free gastric acid, constipation and tenderness of the calf muscles developed. Abnormalities in the electrocardiograms developed in all four cases. The amplitude of all complexes decreased and the daily output of thiamin fell to an unusually low average level of 14 micrograms. Within twelve days after the administration of only 4 mg. of thiamin chloride all defects incident to the previous deficiency had disappeared.

In a recent chemical study of the urinary excretion of thiamin in various clinical conditions, Robinson, Melnick and Field [39] observed that in three cases of "alcoholic beriberi," including one of "beriberi heart," the excretion of thiamin was abnormally small. It is of special interest that six of the seven patients with heart failure due to organic heart disease had values indicative of thiamin subnutrition. Likewise it is pertinent that the twenty-four hour urinary thiamin excretion in subjects whose previous dietary intake of thiamin had been adequate, and who ingested an adequate diet on the day of the test, was 90 micrograms or more in all males and more than 60 micrograms in all females but one.

Cardiac complications have been reported in vitamin deficiencies other than thiamin. With the exception of hemorrhagic pericardial effusion in ascorbic acid deficiency, these disturbances should be considered as part of the coexisting beriberi. Thus Feil [40] described electrocardiographic changes in pellagra. Erdheim [41] observed cardiac dilatation and hypertrophy on postmortem examination of thirty-one Viennese children who had died with the clinical picture of scurvy in the famine year of 1918. Meixner [42] observed dilatation and slight hypertrophy of the left ventricle in children suffering from rickets.

EXPERIMENTAL EVIDENCE ON THIAMIN DEFICIENCY AND CARDIAC DYSFUNCTION

The clinical and experimental evidence in man just presented indicates clearly that beriberi, both "dry" and "wet," is a disease of regular occurrence in America as well as in Europe. The two diseases as observed in the Orient and in the Occident are essentially identical. The dietary history and the clinical response to and reduced excretion of thiamin chloride indicate that in the etiology of "beriberi heart" thiamin deficiency is a primary factor. It is possible that other factors contribute to the disease.[43] The relation of thiamin deficiency to heart disease, however, became even more firmly established as a result of recent investigations on animals. In 1930 Drury, Harris and Maudsley [44] observed a slowing of the heart rate in rats fed on diets deficient in vitamin B_1. Pigeons fed on polished rice also showed bradycardia and in some cases heart block.[45] Méhes and Péter,[46] studying the electrocardiograms of rice-fed pigeons, observed that the PR interval was slightly increased and the S and T waves were slightly lower in some of the deficient birds than in the controls. We have studied the effect of thiamin deficiency on rats.[5] In all but four or five of the twenty-two thiamin-deficient animals the decrease in heart rate was accompanied by changes in the electrocardiographic complexes, consisting most frequently of an increase in height, flattening, inversion or high or low take-off of the T waves and depression of the S-T segments. From several hours to a day after the subcutaneous administration of thiamin chloride the electrocardiographic changes disappeared in most instances, although occasionally several days was required. The effect of exercise on thiamin deficiency has been studied on four rats. In these animals, allowed to exercise on the running wheel, the cardiac changes were no more marked, of no different character and in only one instance quicker to develop than in the control, nonexercising, thiamin deficient animals. Epinephrine induced cardiac irregularity in some of the thiamin deficient rats. Administration of atropine and section of the vagus nerves did not abolish the cardiac slowing or the electrocardiographic changes produced by thiamin deficiency. The thiamin deficient animals showed increased sensitivity to the toxic effects of strophanthin as borne out by electrocardiographic changes. In a subsequent study we [5] concluded that the accumulation of intermediary metabolites plays no significant role in the production of cardiac manifestations in thiamin deficient rats. The finding supports the concept that the manifestation of thiamin deficiency depends on a defect in metabolism rather than on a toxic effect of circulatory metabolites. Large doses of thiamin chloride produced no toxic effects and had little if any influence on the heart rate and electrocardiographic complexes of normal rats and dogs. A vagotonic effect of thiamin on the dog heart could not be definitely established.

De Soldati [47] has studied the circulatory disturbances in thirteen thiamin deficient dogs. In 90 per cent the heart rate became markedly elevated and in 70 per cent the arterial pressure fell. In eleven dogs on which

36a. Bickel, Georges: Hypovitaminose B_1 et cardiopathies: Le role de la carence en vitamine B_1 dans la pathogénie des troubles cardiovasculaires des ethyliques chroniques, Arch. d. mal. méd. du cœur **32:** 657 (July) 1939; II. Le role de la carence en vitamine B_1 dans la pathogenie des troubles cardiaques de la gravidité, ibid. **32:** 769 (Aug.) 1939.

37. Dustin, C. C.; Weyler, Henry, and Roberts, C. P.: Electrocardiographic Changes in Vitamin B_1 Deficiency, New England J. Med. **220:** 15 (Jan. 5) 1939.

38. Williams, R. D.; Mason, H. L., and Smith, B. F.: Induced Vitamin B_1 Deficiency in Human Subjects, Proc. Staff Meet., Mayo Clin. **14:** 787 (Dec. 13) 1939.

39. Robinson, W. D.; Melnick, Daniel, and Field, Henry, Jr.: Urinary Excretion of Thiamin in Clinical Cases and the Value of Such Analyses in the Diagnosis of Thiamin Deficiency, J. Clin. Investigation **19:** 399 (March) 1940.

40. Feil, Harold: A Clinical Study of the Electrocardiogram and of the Phases of Cardiac Systole in Pellagra, Am. Heart J. **11:** 173 (Feb.) 1936.

41. Erdheim, J.: Ueber das Barlow-Herz, Wien. klin. Wchnschr. **31:** 1293, 1918.

42. Meixner, K.: Die Erweiterung der linken Herzkammer bei Rachitis, Wien. klin. Wchnschr. **47:** 1273 (Sept. 6) 1928.

43. Meyers, F. M.: Clinical Investigations in Connection with Beriberi: Two Criteria for the Diagnosis of Berberi, Geneesk. tijdschr. v. Nederl-Indië **78:** 1537 (June 28) 1938; Clinical Investigations in Connection with Beriberi with Special Consideration of Edema, ibid. **79:** 3 (Jan. 3) 1939.

44. Drury, A. N.; Harris, L. J., and Maudsley, Cecil: Vitamin B Deficiency in the Rat: Bradycardia as a Distinctive Feature, Biochem. J. **24:** 1632, 1930.

45. Carter, C. W., and Drury, A. N.: Heart Block in Rice-Fed Pigeons, J. Physiol. **68:** 1, 1929. Carter, C. W.: Maintenance Nutrition in the Pigeon and Its Relation to Heart Block, Biochem. J. **28:** 933, 1934.

46. Méhes, J., and Péter, F.: Die wirkung des Digitoxins auf das Ekg. der normalen und der an experimenteller Beriberi erkrankten Tauben, Arch. f. exper. Path. u. Pharmakol. **176:** 226, 1934.

47. de Soldati, León: Los trastornos circulatorios del perro en avitaminosis B_1. I. El pulso, la tensión arterial y el electrocardiograma, Rev. Soc. argent. de biol. **15:** 142 (July) 1939.

electrocardiograms were taken, increased cardiac rate, enlargement of the P waves, changes in the T waves, depression of the S-T segments and prolongation of the Q-T intervals developed. Following administration of thiamin chloride, these changes disappeared. Porto and de Soldati [48] have studied subsequently the myocardium of four thiamin deficient and two control dogs. The thiamin deficient animals revealed dilatation of the right auricle in all cases and in two of the right ventricle. Intercellular edema and vacuolization of the myocardial conductor and ganglionic fibers were observed. The changes observed by these investigators were similar to those described in human beriberi by Aalsmeer and Wenckebach and by us. These changes are not considered by us as specific, for we were able to demonstrate similar changes in other types of heart disease. Swank and Bessey [49] induced cardiac failure in pigeons with thiamin deficiency. They observed that if pigeons were slowly depleted of their thiamin on a partially thiamin deficient diet, and if starvation was prevented by tube feeding, dyspnea developed in from three to six weeks. The electrocardiograms showed changes in the QRS complex and in the T waves, together with tachycardia. Administration of thiamin chloride produced rapid recovery in all but the most advanced cases. Postmortem examination revealed hydropericardium, pulmonary edema and congestion of the lungs and liver. The myocardium of a large percentage of the animals showed focal necrosis. Bradycardia in thiamin deficiency was present only if there was simultaneous starvation. Finally Swank, Porter and Yeomans [50] found that if a diet partially deficient in thiamin chloride is fed to dogs by tube, they may, after from eight to twelve weeks, develop dyspnea and pulmonary rales and exhibit definite abnormalities of the electrocardiogram. If the animals died during the course of this disorder, at postmortem they showed signs of left ventricular failure (pulmonary congestion and edema). The administration of thiamin chloride promptly resulted in great improvement in the circulation in these animals unless they were actually moribund.

CONCLUSIONS

1. Beriberi both with nervous and with cardiovascular manifestations exists in America and in Europe. Whereas in Oriental beriberi polished rice plays a significant predisposing role, alcohol is the calorigenic substance frequently associated with deficient vitamin intake in the Occident.

2. The clinical features and mechanism of "alcoholic" and "nonalcoholic" beriberi are essentially the same. Similarly, no significant difference could be established between "Oriental" and "Occidental" beriberi.

3. The cardiovascular manifestations of beriberi are related to thiamin deficiency, but other factors may play a secondary role.

4. The evidence now available on the causative relation between thiamin deficiency and cardiovascular dysfunction of beriberi is (*a*) thiamin deficiency in the diet, (*b*) decreased thiamin content in the urine, (*c*) disappearance of the disease after the administration of thiamin chloride, (*d*) induction of electrocardiographic changes in healthy men consuming a diet lacking only thiamin chloride, (*e*) induction in animals on a thiamin deficient diet of cardiac disturbances, including cardiac dilatation, electrocardiographic changes, congestive failure of the circulation and structural changes similar to or identical with those observed in man, and (*f*) disappearance of the experimentally induced cardiovascular dysfunction in animals after administration of thiamin chloride.

48. Porto, Jorge, and de Soldati, León: Alteraciones microscópicas del corazón del perro en avitaminosis B_1, Rev. Soc. argent. de biol. **15:** 303 (Oct.) 1939.

49. Swank, R. L., and Bessey, O. A.: The Cardiac Failure in Thiamin Deficient Pigeons (abstract), J. Clin. Investigation, to be published.

50. Swank, R. L.; Porter, R. R., and Yeomans, A.: The Circulatory Effects of Vitamin B_1 Deficiency in the Dog, to be published.

VITAMIN B_6 (PYRIDOXIN) DEFICIENCY IN HUMAN BEINGS

FURTHER STUDIES, WITH SPECIAL EMPHASIS ON THE URINARY EXCRETION OF PYRIDOXIN

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Last year Spies, Bean and Ashe [1] described a syndrome in four persons characterized by "extreme nervousness, insomnia, irritability, abdominal pain, weakness and difficulty in walking," which disappeared dramatically following the intravenous administration of 50 mg. of synthetic vitamin B_6 (pyridoxin). Since this report was published we have observed and treated with identical results twenty similar cases in which there were residual symptoms of nutritional deficiency which could not be relieved with synthetic nicotinic acid, synthetic thiamine hydrochloride or synthetic riboflavin.[2] In order to obtain more evidence concerning this deficiency state in human beings, we have used the method devised by Scudi, Unna and Antopol [3] to investigate the urinary excretion of normal persons taking an adequate diet and of persons with clinical evidence of pellagra, beriberi, riboflavin deficiency and vitamin B_6 deficiency.

MATERIAL AND METHODS

Five normal persons in the laboratory and six patients whose deficiency syndromes were showing clinical improvement were selected as controls. Urine obtained from twelve patients from the Nutrition Clinic of the Hillman Hospital was tested one or more times. These patients had diagnostic evidence of one or more advanced deficiency disease syndromes (nicotinic acid amide nine, pyridoxin four, riboflavin four, thiamine three). Nine of these patients were studied while ambulatory. The other three patients with similar interrelated deficiencies were arbitrarily selected for hospitalization and restricted for three weeks to a deficient diet before any test was done.

The method of Scudi, Unna and Antopol [3] was used to determine the level of pyridoxin in the urine. (It

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From the Department of Internal Medicine, University of Cincinnati College of Medicine, the Department of Chemistry, Carleton College, Northfield, Minn., and the Department of Preventive Medicine, University of Texas Faculty of Medicine, Galveston.

1. Spies, T. D.; Bean, W. B., and Ashe, W. F.: A Note on the Use of Vitamin B_6 in Human Nutrition, J. A. M. A. **112:** 2414 (June 10) 1939.

2. Spies, T. D.; Hightower, D. P., and Hubbard, L. H.: Some Recent Advances in Vitamin Therapy, J. A. M. A. **115:** 292 (July 27) 1940.

3. Scudi, J. V.; Unna, Klaus, and Antopol, William: A Study of the Urinary Excretion of Vitamin B_6 by a Colorimetric Method, unpublished observations.

was possible by this method to recover 100 per cent of the material from a control urine sample.) The tests were usually made in the morning three or more hours after breakfast, since individuals on a good diet show an increased excretion of test producing substances after meals. The patient voided at a specified time and drank one or two glasses of water. The urine was collected exactly one hour later. Fifty mg. of pyridoxin [4] was then given intravenously, and a sample of urine was collected one hour after the injection. A 5 cc. sample of the urine was diluted with water to 25 or 50 cc. for the test. The blue color produced by this substance was sometimes found in the control specimen, usually in traces only. This value was subtracted from that of the sample for the second hour.[5]

RESULTS

The five normal males excreted an average of 7.9 per cent of the injected pyridoxin in the first hour, with a range of 10.9 to 6.7 per cent. This is in agreement with the finding of 8.7 per cent [3] in normal subjects. The six patients without active deficiency disease excreted an average of 8.6 per cent with extremes of 13.2 to 5.4 per cent. In this regard they did not vary from the normal. The group of nine ambulatory patients with evidence of various vitamin B complex deficiencies excreted an average of 0.5 per cent of the 50 mg. of pyridoxin injected, with a range of 1.5 to 0.0 per cent. The four ambulatory patients suspected of having a vitamin B_6 deficiency excreted an average of 0.2 per cent, with a range of 0.4 to 0.0 per cent. One of these was a patient treated successfully with vitamin B_6 last year.[1]

The three hospitalized patients were tested at the end of three weeks. Two did not excrete any of the pyridoxin given intravenously, while the other excreted only 0.1 per cent. Most of the patients were definitely improved following the injection of the vitamin.

SUMMARY AND CONCLUSIONS

1. The present study shows that within one hour following the intravenous injection of 50 mg. of pyridoxin the average urinary excretion of this material was 7.9 per cent in normal persons and 8.6 per cent in pellagrins who at the time they were studied did not have active vitamin deficiency. These figures are in agreement with those of Scudi, Unna and Antopol, who observed an average excretion of 8.7 per cent.

2. Nine ambulatory patients with clinical evidence of either pellagra, beriberi or riboflavin deficiency excreted an average of 0.5 per cent of the 50 mg. of pyridoxin injected, with a range of from 1.5 to 0.0 per cent. The four patients in this group suspected of having a vitamin B_6 deficiency showed the lowest excretion of any studied, averaging only 0.2 per cent. It is of interest that one of these patients was treated last year for vitamin B_6 deficiency and was having a recurrence.

3. The three patients with clinical deficiency disease who were hospitalized and restricted to a diet deficient in vitamin B_6 excreted almost none of the injected pyridoxin. This observation indicates that absorption of vitamin B_6 is somewhat dependent on the diet.

4. These results show that vitamin B_6 is important in human nutrition and gives strong support to the hypothesis that clinical deficiency diseases occur not as single entities but as complexities.

4. Supplied by Merck & Co., Inc., and E. R. Squibb & Sons.
5. The administration of acetylsalicylic acid to these patients interferes with this test.

SULFATHIAZOLE

CLINICAL EVALUATION

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The successful therapeutic application of sulfanilamide in certain infectious diseases has stimulated investigation of other derivatives of this chemical compound. At the present time there is considerable interest in the thiazole analog of sulfapyridine known as sulfathiazole. This report includes a brief review of the literature concerning the pharmacology, toxicology and therapeutic possibilities of sulfathiazole and presents the results of our clinical experience with sulfathiazole and its sodium salt in the treatment of 128 patients suffering from pneumonia, staphylococcic sepsis and infections of the urinary tract.

Sulfathiazole was first described by Fosbinder and Walter [1] and by Lott and Bergeim.[2] Van Dyke and his associates [3] studied the pharmacology of the drug and concluded that it more rapidly metabolized and underwent less conjugation than sulfapyridine. When the sodium salts of the two compounds were given to mice, they found that sulfathiazole possessed but 65 per cent of the toxicity of sulfapyridine. Long and his co-workers [4] likewise have stated that sulfathiazole was absorbed more readily and excreted more rapidly than sulfapyridine. They also found that, following the administration of a single dose to human beings, from 80 to 90 per cent of the sulfathiazole was recovered in the urine within twenty-four hours and that, compared with sulfapyridine, definitely less of the excreted sulfathiazole was in the conjugated form. In mice the sodium salt of sulfathiazole possessed an acute toxicity one third greater than that of sulfanilamide but one half that of sulfapyridine. Their observations call attention to a most significant point concerning the toxicity of other thiazole derivatives in that when methyl and phenyl groups were introduced the acute toxicity of sulfathiazole for mice was increased by more than 50 per cent. Reinhold, Flippin and Schwartz [5] summarized their experience with the compound when given to human subjects as follows: Sulfathiazole was rapidly absorbed from the gastrointestinal tract and rapidly excreted in the urine; following an intravenous injection of the sodium salt, recovery was practically quantitative in the urine; sulfathiazole was poorly absorbed from the rectum; the extent of conjugation was low in most instances; only transitory effects were observed on renal function and the hemopoietic system; the incidence of toxic manifestations was low, vomiting occurring in about 10 per cent of the cases, never severe enough to necessitate discontinuing the drug. More recently Pep-

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1. Fosbinder, R. J., and Walter, L. A.: Sulfanilamide Derivatives of Heterocyclic Amines, J. Am. Chem. Soc. **61**: 2032 (Aug.) 1939.
2. Lott, W. A., and Bergeim, F. H.: 2- (-Aminobenzenesulfonamide)-Thiazole: A New Chemotherapeutic Agent, J. Am. Chem. Soc. **61**: 3593 (Dec.) 1939.
3. van Dyke, H. B.; Greep, R. O.; Rake, Geoffrey, and McKee, Clara M.: Observations on the Toxicology of Sulfathiazole and Sulfapyridine, Proc. Soc. Exper. Biol. & Med. **42**: 410 (Nov.) 1939.
4. Long, P. H.; Haviland, J. W., and Edwards, Lydia B.: Acute Toxicity, Absorption and Excretion of Sulfathiazole and Certain of Its Derivatives, Proc. Soc. Exper. Biol. & Med. **43**: 328 (Feb.) 1940.
5. Reinhold, J. G.; Flippin, H. F., and Schwartz, Leon: Observations on the Pharmacology and Toxicology of Sulfathiazole in Man, Am. J. M. Sc. **199**: 393 (March) 1939.

per and Horack [6] have brought forth evidence that in the human subject sulfathiazole recrystallized in the kidney tubules, whereas sulfapyridine crystallized most frequently in the renal pelves and ureters. Because of this tendency for intrarenal precipitation of sulfathiazole, they are of the opinion that renal complications following its use will be more serious than those following the use of sulfapyridine. Their microscopic studies of human kidneys confirmed the earlier work of Gross, Cooper and Scott,[7] who noted that in white rats sulfathiazole crystallized in the distal collecting tubules.

Turning now to the experimental work concerning the therapeutic possibilities of sulfathiazole, one is confronted by confusing statements, owing in part perhaps to the different technics employed by the various investigators. However, enough uniformity does exist to permit a reasonably intelligent approach to sulfathiazole therapy in certain infections of man. The data of McKee, Rake, Greep and van Dyke [8] indicate that the therapeutic effect of sulfathiazole in mice was equivalent to that of sulfapyridine for infections due to the pneumococcus, beta hemolytic streptococcus and meningococcus. Both compounds were appreciably effective against the agent of venereal lymphogranuloma but neither affected the viruses of swine influenza or herpes simplex. Long and Bliss [9] concluded that sulfathiazole as a bacteriostatic agent was as effective as sulfapyridine in broth cultures of Lancefield's groups A, D and G strains of the beta hemolytic streptococcus, Escherichia coli, Staphylococcus aureus, pneumococcus types I and II and Bacillus proteus. Sulfathiazole was slightly less effective in the control of pneumococcic infections in mice, but the difference was partially invalidated because of the more rapid absorption and excretion of sulfathiazole. On the other hand, Lawrence [10] stated that sulfathiazole had a superior inhibitory action on the growth of pneumococci types I, II and III, group A beta hemolytic streptococcus and gonococcus. As a result of the in vitro studies of Rake and McKee [11] and of Rammelkamp and Keefer,[12] it would appear that sulfathiazole had greater bacteriostatic activity for Staphylococcus aureus than either sulfapyridine or sulfanilamide. Likewise, mice infected with Staphylococcus aureus were protected to a greater degree with sulfathiazole than with sulfapyridine.[13]

There is experimental evidence that sulfathiazole will be as effective as sulfanilamide and sulfapyridine, if not more so, in the therapy of infections of the urinary tract. Helmholz [14] found that sulfathiazole had a bactericidal action on strains of Streptococcus faecalis, whereas sulfanilamide or sulfapyridine did not. Sulfathiazole also readily killed strains of Bacillus proteus. Neter [15] has confirmed the superior bacteriostatic action of sulfathiazole on Streptococcus faecalis (enterococci). Hill [16] concluded that sulfanilamide, sulfapyridine and sulfathiazole had an equal bacteriostatic action on strains of Staphylococcus aureus, Streptococcus faecalis, Escherichia coli, Aerobacter aerogenes and Bacillus proteus.

Only a few reports are available concerning the value of sulfathiazole in the treatment of human infections. In a preliminary report for the Council on Pharmacy and Chemistry of the American Medical Association, Long [17] was of the opinion that sulfathiazole was about as effective as sulfapyridine in the treatment of pneumococcic pneumonia, and possibly more effective in staphylococcic infections. Fitch [18] reported a case of septicemia and pyemia due to Staphylococcus aureus successfully treated with sulfathiazole. Pool and Cook [19] treated fifteen patients having infections of the urinary tract with sulfathiazole and stated that the drug was as efficient as the other sulfanilamide derivatives and more so in infections due to Staphylococcus aureus.

TABLE 1.—*Incidence of the Various Clinical Conditions*

Disease		No. of Cases
Lobar and atypical pneumonia		33
Postoperative pneumonia		24
Pneumococcic meningitis		3
Pneumococcic bacteremia, otitis media and glomerular nephritis		1
Pneumococcic abscess (compound fracture)		1
Staphylococcic sepsis (septicemia—15 cases)		36
Infections of the urinary tract		10
Miscellaneous infections		
Subacute bacterial endocarditis	2	
Escherichia coli bacteremia	2	
Gonococcic arthritis	4	
Septicemia (beta hemolytic streptococcus)	1	
Septicemia (alpha streptococcus)	1	
		128

They maintained that sulfathiazole was less toxic than either sulfanilamide or sulfapyridine. Flippin, Schwartz and Rose [20] treated 100 patients having pneumococcic pneumonia with sulfathiazole and an equal number with sulfapyridine. These two drugs appeared to be equally effective. The incidence and severity of nausea and vomiting were much less in the sulfathiazole group, whereas other toxic manifestations were about equal.

MATERIALS AND METHODS

The types of clinical conditions among the 128 patients treated with sulfathiazole are presented in table 1.[21] In selecting the patients for therapy an attempt was made in each instance to isolate the biologic agent responsible for the disease.

Patients with pneumonia were divided into two main groups: the first included those with lobar or atypical

6. Pepper, D. S., and Horack, H. M.: Crystalline Concretions in the Renal Tubules Following Sulfathiazole Therapy: Widely Patent Foramen Ovale in a Patient Aged 77, Am. J. M. Sc. **199:** 674 (May) 1940.
7. Gross, Paul; Cooper, F. B., and Scott, Ruth E.: Urolithiasis Medicamentosa, Urol. & Cutan. Rev. **44:** 205 (April) 1940.
8. McKee, Clara M.; Rake, Geoffrey; Greep, R. O., and van Dyke, H. B.: Therapeutic Effect of Sulfathiazole and Sulfapyridine, Proc. Soc. Exper. Biol. & Med. **42:** 417 (Nov.) 1939.
9. Long, P. H., and Bliss, Eleanor A.: Bacteriostatic Effects of Sulfathiazole upon Various Micro-Organisms: Its Therapeutic Effects in Experimental Pneumococcal Infections, Proc. Soc. Exper. Biol. & Med. **43:** 324 (Feb.) 1940.
10. Lawrence, C. A.: Bacteriostatic Actions of Three Thiazole Derivatives of Sulfanilamide on Bacteria in Broth Cultures, Proc. Soc. Exper. Biol. & Med. **43:** 92 (Jan.) 1940.
11. Rake, Geoffrey, and McKee, Clara M.: Action of Sulfathiazole and Sulfamethylthiazole on Staphylococcus Aureus, Proc. Soc. Exper. Biol. & Med. **43:** 561 (March) 1940.
12. Rammelkamp, C. H., and Keefer, C. S.: Sulfathiazole: Effect on Staphylococcus Aureus in Vitro, Proc. Soc. Exper. Biol. & Med. **43:** 664 (April) 1940.
13. Bliss, Eleanor A., and Ott, Earl: Effect of Sulfapyridine, Sulfathiazole and Sulfamethylthiazole on Severe Staphylococcal Infections in Mice, Proc. Soc. Exper. Biol. & Med. **43:** 706 (April) 1940. Rake and McKee.[11]
14. Helmholz, H. F.: The Bactericidal Effect of Sulfathiazole and Sulfamethylthiazole in Bacteria Found in Urinary Infections, Proc. Staff Meet., Mayo Clin. **15:** 65 (Jan. 31) 1940.
15. Neter, Erwin: Comparative Study on Bacteriostatic Action of Sulfanilamide, Sulfapyridine, Sulfanilyl Sulfanilamide and Sulfathiazole on Enterococci, Proc. Soc. Exper. Biol. & Med. **43:** 774 (April) 1940.
16. Hill, Justina H.: The Comparative In Vitro Action of Sulfanilamide, Sulfapyridine and Sulfathiazole in Urine, J. Urol. **43:** 491 (March) 1940.
17. Long, P. H.: Sulfathiazole and Sulfamethylthiazole, J. A. M. A. **114:** 870 (March 9) 1940.
18. Fitch, T. S. P.: Sulfathiazole in Staphylococcus Aureus: Epidural Abscess with Septicemia and Pyemia, Arch. Pediat. **57:** 119 (Feb.) 1940.
19. Pool, T. L., and Cook, E. N.: Sulfathiazole and Sulfamethylthiazole in the Treatment of Infections of the Urinary Tract, Proc. Staff Meet., Mayo Clin. **15:** 113 (Feb. 21) 1940.
20. Flippin, H. F.; Schwartz, Leon, and Rose, S. B.: The Comparative Effectiveness and Toxicity of Sulfathiazole and Sulfapyridine in Pneumococcic Pneumonia, Ann. Int. Med. **13:** 2038 (May) 1940.
21. The sulfathiazole was supplied to us by Dr. George A. Harrop, director of the Squibb Institute for Medical Research.

pneumonia and the second comprised those having postoperative pneumonia. The sputum was examined bacteriologically in all instances in which it was possible, and if pneumococci were present the Neufeld method was employed in typing. Blood cultures were obtained from all the patients with pneumonia before therapy was instituted.

The following data from the patients were obtained for purposes of therapeutic evaluation of the sulfathiazole: age; time of onset of illness; extent of pulmonary involvement; complicating factors, such as alcoholism, pregnancy and concurrent diseases; serial x-ray films of the lung fields during therapy, and effect of therapy on the clinical course, temperature, pulse, respiration and blood morphology. The oral dosage of sulfathiazole in the treatment of older children and adults with pneumonia consisted of an initial dose of from 2 to 4 Gm. and then 1 Gm. every four hours until the temperature remained normal for forty-eight hours. The dose then was gradually reduced and therapy was discontinued on the fifth to the seventh day. The dosage for infants and small children was 0.25 Gm. per kilogram of body weight a day in divided doses for a period of from twenty-four to forty-eight hours or until the temperatures dropped to normal; then the dose was gradually reduced and the drug discontinued on the fifth to the seventh day. In the earlier stages of this study we gave from 0.6 to 1 Gm. of sodium bicarbonate with each dose of sulfathiazole, but our later policy, and the one employed at the present time, does not include the administration of the alkali. In three instances type specific antipneumococcus rabbit serum was given in addition to the sulfathiazole. Since postoperative pneumonia is, for the most part, a process of atelectasis with or without an accompanying pneumonitis, sulfathiazole was given in an attempt to abort the spread or development of a pneumonic consolidation. Pneumococci of the higher types were found in the sputum of the majority of these patients. Many could not take medication orally; thus the sodium salt of sulfathiazole was given intravenously. A 5 per cent solution was freshly prepared by dissolving the salt in warm distilled water. Usually 3 Gm. was given as the initial dose and then 1 Gm. every eight hours. Oral therapy was instituted as soon as possible thereafter.

TABLE 2.—*Distribution of Pneumococcus Types Among Thirty-Three Patients with Lobar and Atypical Pneumonia Treated with Sulfathiazole*

Pneumococcus Type	No. of Patients	Comment
I	5	1 bacteremia, diabetic acidosis; 1 alcoholic psychosis
III	7	2 cardiac failures, 1 severe jaundice
III and IV	1	
V	2	1 pregnancy
VI	1	
VIII	2	1 died of lung abscess
IX	1	
XI	1	
XVII	1	
XVIII	1	Sinusitis
XIX	1	
XXII	1	
Untyped	9	
	33	

Three patients with pneumococcic bacteremia, mastoiditis and meningitis were treated according to the method of Finland.[22] Type-specific antipneumococcus serum was immediately given intravenously. Shortly thereafter blood was withdrawn and allowed to clot and the serum drawn off and injected intrathecally. The further intrathecal injection of serum containing complement and antibodies depended on the response of the patient. Surgical drainage of the mastoid area was carried out on two of the three patients during the early stages of their illness.

Two groups of patients with staphylococcic infections were treated with sulfathiazole. The first group of twenty-one patients was that presenting localized lesions without demonstrable bacteremia and included such conditions as carbuncles, postoperative wound infections, decubitus ulcers, osteomyelitis, otitis media and empyema. Staphylococci were obtained from the lesions of all these patients. In some cases the topical application of sulfathiazole was employed. The second group consisted of fifteen patients having staphylococcic septicemia. The dose of sulfathiazole was essentially the same as that used in the therapy of patients with pneumonia, except that the drug was given over a longer period of time. Blood cultures were obtained before, during and after sulfathiazole therapy.

Twenty patients with infections of the urinary tract were treated in cooperation with Dr. C. D. Creevy, chief of the division of urology. We were particularly interested in infections due to Bacillus proteus, Escherichia coli and the staphylococcus. Carefully catheterized specimens of urine were cultured before therapy was begun and again at various intervals after sulfathiazole therapy had been discontinued.

The concentration of the free and conjugated forms of sulfathiazole in the blood were determined[23] by the method of Marshall and Litchfield.[24] In the group with infections of the urinary tract, the concentration in the urine was quantitated.

LOBAR AND ATYPICAL PNEUMONIA

The results of sulfathiazole therapy of thirty-three patients with lobar or atypical pneumonia are presented in table 2. Attempts to type pneumococci in the sputums of nine of these patients were unsuccessful because they were first seen very early in the course of illness and were not coughing up any material. Bacteremia was demonstrated in only one case. Death of but one of these thirty-three patients occurred, and this subject was an elderly man who died three months after the onset of pneumonia from multiple lung abscesses. He was afflicted also with pernicious anemia. Type specific antipneumococcus rabbit serum was used in three cases in addition to the sulfathiazole. Of these three patients, one had a type I bacteremia and pneumonia and in addition severe diabetic acidosis and a furuncle. His temperature failed to decrease below 101 F. after twenty-four hours of sulfathiazole therapy, although bacteremia was no longer present. He therefore was given 100,000 units of type I antipneumococcus serum, which was followed by a prompt fall in temperature. Subsequently empyema due to type I pneumococci developed and was successfully drained. The second patient receiving serum had a type III pneumonia and a moderate degree of icterus. She responded poorly to sulfathiazole so 200,000 units of specific antipneumococcus serum was given. Following this the patient

22. Finland, Max; Brown, J. W., and Raugh, A. E.: Treatment of Pneumococcic Meningitis, New England J. Med. **218**: 1033 (June 23) 1938.

23. The determinations were performed under the direction of Dr. G. T. Evans, director of laboratory service, University of Minnesota Hospitals.

24. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: Determination of Sulfanilamide, Science **88**: 85 (July 22) 1938.

slowly improved, but at the time she left the hospital several weeks later she had residual lung abscesses. The third patient had a type V pneumonia and was in the last trimester of pregnancy. Her temperature failed to decrease after adequate doses of sulfathiazole, so she was given 53,000 units of specific antipneumococcus rabbit serum. Shortly thereafter her temperature became normal.

The effect of sulfathiazole on the clinical course of pneumonia was less dramatic than that which we have experienced with the use of sulfapyridine. The temperature curves showed a slower and more gradual approach to normal following the administration of sulfathiazole. Although the number of cases that we have presented is small, the end results with sulfathiazole compare very favorably with sulfapyridine, and the patients as a whole tolerated the former drug much better. Toxic manifestations were less frequently encountered in this group of patients than in a comparable group treated with sulfapyridine. Vomiting occurred in only one instance. The drug had to be discontinued in one case because of the appearance of an erythema nodosum-like cutaneous lesion with drug fever on the ninth day of treatment. It is of interest that one patient who had received sulfapyridine five months previously for pneumonia had at that time an extensive dermatitis. When this patient was given sulfathiazole a papular eruption appeared on her arms shortly after therapy was instituted, but this medication was continued for several more days with no untoward reactions.

POSTOPERATIVE PNEUMONIA

Of the twenty-two patients having postoperative pneumonia treated with sulfathiazole, twelve were given the sodium salt intravenously. None of the patients had a bacteremia due to the pneumococcus; however, Escherichia coli was demonstrated in the blood of one patient. Although two of the patients died, death was attributable to causes other than the pneumonia. The toxic manifestations following the use of the sodium salt of sulfathiazole were minimal, although one patient had a gross hematuria with no other evidence of kidney dysfunction. A further discussion of sulfathiazole in the treatment of postoperative pneumonia will be presented elsewhere.

PNEUMOCOCCIC MENINGITIS

Three patients with pneumococcic meningitis were treated with sulfathiazole and specific antipneumococcus rabbit serum. Because there are no reports available in the literature concerning the value of sulfathiazole in the therapy of pneumococcic meningitis, the course of events in the illness of each of these patients is presented:

CASE 1.—M. S., a housewife aged 39, entered the service of Dr. Horace Newhart of the University Hospitals on March 4, 1940, in a comatose condition. Ten days before, an infection of the upper respiratory tract had developed, followed by a bilateral earache, headache, stiff neck, nausea and vomiting, and finally coma. The left ear drum was injected and there was tenderness over the right mastoid area. The neck was held in rigid hyperextension; Kernig's and Brudzinski's signs were positive. Lumbar puncture showed the spinal fluid to have a pressure of 18 mm. of mercury; 600 cells were present with 94 per cent polymorphonuclear leukocytes and 4 per cent monocytes; sugar was less than 15 mg. per hundred cubic centimeters, protein 1.2 Gm. per hundred cubic centimeters. Type III pneumococci were isolated from cultures of the spinal fluid, blood and exudate of both ears.

Shortly after admission the patient was given 175,000 units of type III antipneumococcus rabbit serum intravenously. This was followed by a lumbar puncture, drainage of the fluid and the intrathecal introduction of specific type III pneumococcus antibody and fresh human serum. Thereafter daily drainage of spinal fluid was carried out and the fluid replaced with human serum and type III antipneumococcus rabbit serum. Sulfathiazole was administered orally through a nasal tube, and on two occasions she was given the sodium salt of sulfathiazole intravenously. The course of the patient's illness is depicted in chart 1. The blood concentration of sulfathiazole was maintained at high levels throughout her illness. After the first day, repeated cultures of the spinal fluid and blood remained sterile. However, her condition became worse on the fifth day, when she had marked abdominal distention and severe diarrhea. She became cyanotic, the Cheyne-Stokes type of respiration developed and she died March 13. At necropsy there was little involvement of the meninges. Death was attributed to an extensive and severe peritonitis.

The following case is of exceptional interest because on two different occasions the patient entered the hospital suffering from meningitis. The first attack was due to a beta hemolytic streptococcus and the second to a type III pneumococcus. The patient recovered completely from both infections.

CASE 2.—W. V., a boy aged 6 years, was first seen in the University Hospitals on Dec. 23, 1938. About ten days before

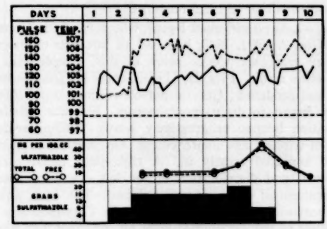

Chart 1 (case 1).—Type III pneumococcus meningitis unsuccessfully treated with sulfathiazole.

he had complained of a bilateral earache, following which the ears began to drain. Subsequently fever, projectile vomiting and a stiff neck developed and he appeared dehydrated and irrational. The tympanum of each ear was thickened, but no exudate was seen. The neck was rigid, the thighs were held in flexion, and Kernig's and Brudzinski's signs were present.

Bilateral myringotomy revealed no exudate. An x-ray film of the left mastoid area showed evidence of an acute inflammatory process. Cultures of venous blood remained sterile. Examination of the spinal fluid showed it to be under increased pressure. There were 5,300 cells with 69 per cent polymorphonuclear leukocytes and 31 per cent monocytes. A pure culture of beta hemolytic streptococci was isolated from the fluid. The protein level was 171 mg. per hundred cubic centimeters. The course of his illness is illustrated in chart 2. Following the administration of the sulfanilamide the spinal fluid cultures remained sterile and he progressively improved. He left the hospital Jan. 17, 1939.

He entered the University Hospitals the second time on March 1, 1940. He had been in good health since his previous discharge from the hospital until ten days before the present entry, when he contracted an infection of the upper respiratory tract. This was followed by pain in the left ear, headache, nausea and vomiting, and stupor. On examination the patient was stuporous and had a left facial paralysis. The ears showed slight, purulent discharge from the left and edema of the tympanum on the right. His neck was rigid; the reflexes of the extremities were hyperactive; Kernig's sign was present. Lumbar puncture yielded spinal fluid that was slightly cloudy. There

were 7,200 leukocytes, of which 58 per cent were polymorphonuclear neutrophils and 42 per cent monocytes. There were 221 mg. of protein per hundred cubic centimeters. Type III pneumococci were isolated from the spinal fluid and the blood stream. He was given an initial dose of the sodium salt of sulfathiazole intravenously and then the drug was administered orally. Following this, 136,000 units of type III antipneumococcus rabbit serum was given intravenously. Antibody and complement were injected intrathecally. The day after entry a left mastoidectomy was performed, and when the dura over the entire middle fossa was uncovered a purulent exudate was found on the surface. The blood stream and spinal fluid were successfully sterilized within twenty-four hours after therapy was instituted. Chart 3 illustrates the clinical course of this patient. It is important to note the low levels of sulfathiazole in the spinal fluid as compared to the concentrations in the blood. The patient left the hospital March 28 in good condition and has remained well.

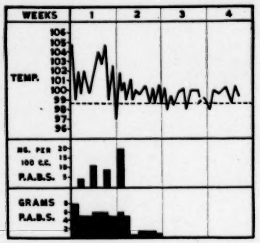

Chart 2 (case 2).—Beta hemolytic streptococcus meningitis successfully treated with sulfanilamide.

CASE 3.—I. M., a girl aged 1 year, who entered the University Hospitals on April 1, 1940, had had an injection of the upper respiratory tract six weeks prior to this, complicated by a bilateral otitis media. Five days before entry her left eye became swollen and reddened. Generalized convulsions were observed. Her ears began to drain spontaneously. She was febrile and her condition became progressively worse. Sulfanilamide had been given without any improvement. On physical examination the child appeared acutely ill. A right-sided facial paralysis and a ptosis and discoloration of the left eye were observed. The tympanum of each ear was inflamed. The neck was held in rigid extension. Respiration was of the Cheyne-Stokes type. The reflexes of the extremities were all increased and Kernig's sign was present. Type XVIII pneumococci were cultured from both the blood and the spinal fluid. The spinal fluid had a ground glass appearance and was under a pressure of 40 mm. of mercury. Examination revealed only 9 monocytes, protein was 162 mg. per hundred cubic centimeters and sugar was less than 15 mg. per hundred cubic centimeters. Sulfathiazole was administered intravenously and then orally through a nasal tube. A total of 40,000 units of type XVIII antipneumococcus rabbit serum was given intramuscularly and intravenously. Specific serum and human complement were administered intrathecally. Subsequent blood cultures remained sterile, but type XVIII pneumococci were constantly recovered from the spinal fluid. Failure to sterilize the spinal fluid may be explained partly on the basis that at times there was evidence of a partial block of the spinal canal. It is of interest that the levels of free sulfathiazole in the blood were 7.8, 8.9, 4.3, 7.5, 19.9 and 1.2 mg. per hundred cubic centimeters, while simultaneously the concentrations in the spinal fluid were 4.4, 5.4, 1.8, 2.7, 2.1 and 2.7 mg. per hundred cubic centimeters. The patient's condition became progressively worse and she died April 20. Postmortem examination revealed evidence of an extensive basilar meningitis and pneumonia.

MISCELLANEOUS PNEUMOCOCCIC INFECTIONS

The following case is of interest because of the unusual nature of the disease process and the successful use of sulfathiazole in the presence of acute glomerular nephritis:

CASE 4.—G. S., a boy aged 12 years, contracted right otitis media three weeks before entry to the hospital. He had fever and swelling of the tissue over the right mastoid area. Two weeks after the onset of his illness there appeared a generalized edema of the face and extremities, accompanied by vomiting. The night before entry there occurred a sudden onset of severe dyspnea. When first seen in the hospital, he was cyanotic, irrational and extremely dyspneic. His temperature was 106 F. There were loud bubbling moist rales throughout both lung fields. The heart was enlarged to the left on percussion. The rate was 160 per minute with a gallop rhythm. The blood pressure was 120 mm. of mercury systolic and 90 mm. diastolic. The external jugular veins were engorged and pulsating. The abdomen was distended and the liver enlarged. Urinalysis showed a large trace of albumin, and the sediment contained numerous granular and hyaline casts, erythrocytes and leukocytes. The blood urea nitrogen was 29.3 mg. per hundred cubic centimeters. Type XII pneumococci were isolated from the blood. X-ray films of the chest revealed marked pulmonary edema and generalized enlargement of the heart. It was apparent that the patient had pneumococcic bacteremia probably originating from the otitis media, acute glomerular nephritis with nitrogen retention, and acute cardiac failure with pulmonary edema. Shortly after admission a venesection was performed and 450 cc. of blood was withdrawn. Then 50 cc. of a 50 per cent solution of sorbitol with 0.24 Gm. of aminophylline was given intravenously, following which considerable improvement was noted. Because of the pneumococcic bacteremia, 4 Gm. of the sodium salt of sulfathiazole was given intravenously and eight hours later 2 Gm., a similar dose being repeated in another eight hours. His temperature dropped from 106 F. to normal within twenty-four hours and remained there. Blood cultures remained sterile. He continued to receive sulfathiazole orally after the foregoing intravenous therapy for seven days. His improvement continued and he left the hospital May 6, 1940. When seen one month later he was in good health with no residual evidence of his having had nephritis.

Another unusual pneumococcic infection which was treated is reported in case 5:

CASE 5.—A boy aged 7 years fell and received a compound fracture of the ulna and radius of the left arm twelve days before admission to the hospital. The tissue overlying the fracture site became infected and 150 cc. of purulent material was aspirated from a localized abscess. This contained a pure culture of type V pneumococci. Blood cultures were sterile. Pneumococci were not isolated from cultures of material taken from the nose and throat. The arm was immobilized and the area treated with hot packs. At the same time sulfathiazole was administered orally for five days. Coincident with this therapy, the infection subsided and on x-ray examination four weeks later callus formation was abundant. His general condition was good, and there was normal function of the hand when the patient was seen six weeks later.

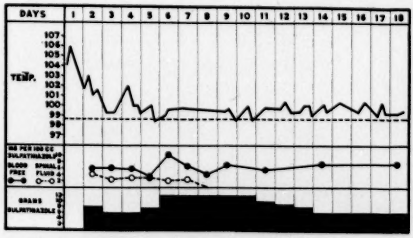

Chart 3 (case 2).—Type III pneumococcus meningitis successfully treated with sulfathiazole and type III antipneumococcus rabbit serum.

STAPHYLOCOCCIC SEPSIS

In the group of thirty-six patients who had staphylococcic sepsis there were twenty-two having localized lesions without demonstrable invasion of the blood stream by organisms. The lesions included postopera-

tive wound infections, otitis media and mastoiditis, empyema, suppurative arthritis, carbuncles, decubitus ulcers, osteomyelitis and subcutaneous abscesses but did not include any infections of the urinary tract. In treating these patients we were fully aware of the inhibitory effect of bacteria, leukocytes and necrotic material on the bacteriostatic action of sulfathiazole. Our object in treating them was not directed primarily at the abscessed tissue but at preventing spread of the infection to healthy tissue and possible invasion of the blood stream. Two methods of therapy with sulfathiazole were employed: One was to administer the drug orally, endeavoring to maintain a constant concentration of 5 mg. per hundred cubic centimeters of free sulfathiazole in the blood. This therapy was continued for only a few days in some cases and for several weeks in others. The second method was to apply sulfathiazole locally to the diseased tissue. For this purpose we used pure sulfathiazole crystals and sprinkled them into the wound; or the crystals were suspended in sterile distilled water, cod liver oil or physiologic solution of sodium chloride and the suspension then introduced into the infected area. The oral administration of sulfathiazole often was combined with the topical application of the chemical. One of us (W. W. S.) carried out this phase of our sulfathiazole studies with Dr. John R. Paine of the department of surgery, and a more complete report is forthcoming concerning the methods and results. In brief, the topical application of sulfathiazole entails adequate drainage and immobilization of the infected area, frequent irrigations with mild antiseptic solutions to eradicate purulent and sloughing material, saturation of the wound with sulfathiazole, and, in some instances, the administration of sulfathiazole orally. In the majority of cases treated in this manner but little of the sulfathiazole appeared in the circulating blood. The results have been highly satisfactory and merit further investigation.

Our most satisfactory clinical results with sulfathiazole occurred in the group of fifteen patients with staphylococcic septicemia. All these patients recovered. One patient died subsequently from leukemia. Since we have treated a comparable number of patients having staphylococcic septicemia with sulfapyridine, a detailed report is in preparation describing our clinical experience with chemotherapy in this type of infection. So far as the use of sulfathiazole is concerned, the drug was administered orally, when possible, so that a concentration of from 4 to 5 mg. of free sulfathiazole was maintained in the blood. It is doubtful whether higher levels are necessary. It should be emphasized that in conjunction with the exhibition of sulfathiazole it is imperative that adequate drainage of the focus or foci be carried out promptly. The length of time sulfathiazole therapy should be continued is dependent on the individual case. It is our belief at the present writing that sulfathiazole is the most effective therapeutic agent in the treatment of staphylococcic septicemia.

INFECTIONS OF THE URINARY TRACT

A majority of the twenty patients who had urinary infections were treated in cooperation with Dr. C. D. Creevy. The drug was given a severe therapeutic test in some of these instances. Many of the patients had been treated unsuccessfully with other therapeutic agents, including sulfanilamide and sulfapyridine. Furthermore, some of the patients had partial obstruction of the urinary tract. The offending organisms included alpha hemolytic streptococcus (faecalis and viridans), Staphylococcus albus and aureus, Bacillus proteus and Escherichia coli. Dr. Creevy informed us that in his experience infections of the urinary tract due to Bacillus proteus were most resistant to all forms of therapy. The dose of sulfathiazole used in these cases was 1 Gm. from four to six times a day for from seven to ten days. Definite clinical improvement was obtained in thirteen of the twenty cases. It may be of significance that the highest incidence of toxic reactions from sulfathiazole was in this group of patients with infections of the urinary tract. It would appear from our experience with this group that sulfathiazole may have a definite place in the therapy of infections of the urinary tract, particularly infections due to staphylococci, alpha hemolytic streptococci, Bacillus proteus and, in some instances, Escherichia coli.

MISCELLANEOUS INFECTIONS

Table 1 lists the nature of the miscellaneous infections treated. No clinical improvement was obtained by two patients with subacute bacterial endocarditis due to

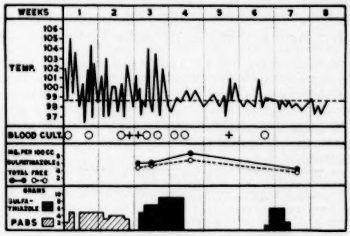

Chart 4.—Recovery of a man aged 55 from septicemia due to alpha hemolytic streptococci (Streptococcus viridans) following administration of sulfathiazole.

Streptococcus viridans. The blood stream of two patients was cleared of Escherichia coli following the use of sulfathiazole. In one the primary focus was in the urinary tract, and in the second the bacteremia followed an enterostomy performed because of an acute intestinal obstruction. Although only four patients having gonococcic arthritis were treated with sulfathiazole, the clinical results were less satisfactory than those obtained with equivalent doses of sulfanilamide and sulfapyridine. In two of these four cases there was some clinical improvement following adequate doses of sulfathiazole, but the improvement was more marked when sulfanilamide was given subsequently. One elderly patient with a severe infection due to beta hemolytic streptococci did not respond to sulfathiazole therapy. A patient with septicemia due to alpha hemolytic streptococci (Streptococcus viridans) was of particular interest. He had had daily chills and fever for three weeks, and streptococci had been isolated from his blood on three occasions. At one time there were 167 colonies per cubic centimeter of blood. It was the consensus of the consulting staff that the primary focus was in the biliary tract. Sulfanilamide was given with but little clinical improvement. Sulfathiazole was then administered, following which the patient's temperature approached normal and blood cultures became sterile. When the sulfathiazole was discontinued he again had fever, and streptococci were recovered from the blood stream. After resumption of sulfathiazole therapy, his

fever subsided and blood cultures again became sterile. He improved rapidly and has been in good health ever since. The clinical course in this case is illustrated in chart 4.

ABSORPTION, EXCRETION AND CONJUGATION

From the observations made in these studies, we are able to conclude that sulfathiazole was absorbed less readily than sulfanilamide and more readily than sulfapyridine. When patients were given sulfanilamide orally in divided doses, it was observed that higher concentrations could be obtained and maintained in the blood than could concentrations of sulfathiazole when the same patients were given sulfathiazole at another period. It should be pointed out, however, that this difference is more apparent than real, since sulfathiazole is excreted more rapidly than sulfanilamide. In other words, sulfathiazole may be absorbed to the same extent as sulfanilamide, but there might be some difficulty in maintaining equivalent concentrations in the blood because of this difference in excretion. Sulfathiazole was eliminated from the body much more rapidly than either sulfanilamide or sulfapyridine, and practically all of the drug that was absorbed could be recovered quantitatively in the urine. We have noted

TABLE 3.—*Toxic Manifestations Encountered in Group of One Hundred Patients Treated with Sulfathiazole*

Manifestation	No. of Patients
Dermatitis	9
Nausea and vomiting	6
Nitrogen retention and oliguria	1
Gross hematuria	1
Drug fever	2
Burning and itching of the eyes	2
Injection of conjunctivas	1
Anemia	1

in some cases that, following the oral administration of sulfathiazole, the urine appeared quite cloudy, and a white sediment formed when the urine was allowed to stand at room temperature for several hours. This sediment consisted almost entirely of sulfathiazole crystals. It was observed that when a single dose of sodium sulfathiazole was given to a patient intravenously a large amount of the drug was excreted within fifteen hours. An analysis of several hundred determinations of the concentration of the free and conjugated forms of sulfathiazole in the blood of patients permits us to conclude that the average amount of conjugated sulfathiazole is about 20 per cent. In two cases 50 per cent of the drug was present as the conjugated form. It is difficult to evaluate the amount of drug that a given patient will conjugate when the single dose method is used, since we have observed that the degree of conjugation varies when several doses are given over a period of several hours or days. The degree of conjugation is somewhat greater than that which is encountered following the admistration of sulfanilamide; on the other hand, it is definitely less than the amount of sulfapyridine that is usually conjugated.

TOXICITY

The toxic manifestations from sulfathiazole are based on observations made on 100 patients (table 3). The most common evidence of toxicity was a cutaneous eruption, which usually appeared after the drug had been given for several days. It was a maculopapular type of eruption, most prominent over the extremities. In four of the cases the lesion simulated erythema nodosum very closely. In one of these drug therapy was discontinued and the lesion disappeared. After a lapse of several days the same doses of sulfathiazole were given without any further cutaneous eruption.

Nausea and vomiting occurred in six cases, but in only one was it severe enough to warrant discontinuing further administration of the drug. The degree and incidence of this complication were definitely less than with sulfapyridine therapy. Sodium sulfathiazole has been given intravenously in thirteen cases without producing any evidence of nausea or vomiting.

One patient suffered from oliguria and nitrogen retention after receiving 27 Gm. of sulfathiazole by mouth in five and one-half days. He recovered completely. Gross hematuria was encountered once following the intravenous administration of sodium sulfathiazole. This patient had no other evidence of kidney dysfunction.

Two patients complained of burning and itching of the eyes while receiving sulfathiazole. This promptly subsided when therapy was stopped. One other patient had a marked injection of the conjunctiva of one eye with a slight amount of purulent discharge while receiving the drug.

Anemia of a moderate degree was noted in only one instance. In no instance was there a depression of the leukocytes or granulocytes that could be attributed solely to the drug.

SUMMARY

In the course of these studies on 128 subjects suffering from a variety of infections we have endeavored to compare sulfathiazole with sulfanilamide and sulfapyridine as regards its pharmacology, toxicology and therapeutic effectiveness. Comment has already been made on its absorption and excretion. Of considerable importance is the question of toxicity. Thus far, in our experience, sulfathiazole appears to be no more toxic than either sulfanilamide or sulfapyridine. In fact, the troublesome nausea and vomiting that not infrequently follow the administration of sulfapyridine are not so commonly encountered when sulfathiazole is used. The incidence of dermatitis, however, is greater following the use of sulfathiazole than either sulfanilamide or sulfapyridine. As regards the therapeutic phase of the study, it appears that sulfathiazole has the same value as sulfapyridine in the treatment of pneumococcic pneumonia. Sulfapyridine seems to cause a more abrupt fall in temperature than sulfathiazole; however, there is some evidence that sulfapyridine may have a nonspecific antipyretic effect. When sulfapyridine was given to febrile patients who had fever not due to an infectious agent a prompt decrease in the temperature was noted, which in turn was followed by a rise when the drug was omitted. This was especially true in a case of lymphatic leukemia in which there was no evidence of an infection. Whether or not sulfathiazole is as valuable as sulfapyridine in the therapy of pneumococcic meningitis is dependent on further investigation, as is also the topical application of sulfathiazole for localized staphylococcic lesions. However, there is no doubt that sulfathiazole is more effective than sulfapyridine in the treatment of staphylococcic septicemia and appears to be the best therapeutic agent available for this infection at the present time. Sulfathiazole appears to be of especial value in the treatment of infections of the urinary tract

due to Bacillus proteus, alpha hemolytic streptococci, Escherichia coli and staphylococci. Its exhibition may result in sterile cultures of urine when sulfanilamide therapy has been ineffective.

CONCLUSIONS

1. In thirty-three cases of pneumococcic pneumonia, sulfathiazole appeared to be fully as effective a therapeutic agent as sulfapyridine.

2. Recovery of one of the three patients having pneumococcic meningitis occurred following administration of sulfathiazole and type specific serum.

3. Fifteen consecutive patients with staphylococcic septicemia were successfully treated with sulfathiazole. (One patient died subsequently of leukemia.)

4. The results of the use of sulfathiazole in the treatment of twenty cases of infection of the urinary tract, many of which had been refractory, suggested that this drug may be a useful adjunct in the therapy of infections of the urinary tract, particularly those due to staphylococci, Bacillus proteus, alpha hemolytic streptococci and Escherichia coli.

5. Sulfathiazole was readily absorbed and quickly excreted in the urine, while the degree of conjugation was less than that occurring with sulfapyridine.

6. Less nausea and vomiting accompanied the use of sulfathiazole when compared with sulfapyridine; however, dermatitis was more frequently encountered with sulfathiazole than with either sulfanilamide or sulfapyridine.

Clinical Notes, Suggestions and New Instruments

LOCAL ANAPHYLACTIC (ARTHUS?) PHENOMENA FROM PARENTERAL INJECTIONS OF HISTAMINASE

SIGMUND S. GREENBAUM, M.D., PHILADELPHIA

Typical examples of local anaphylaxis are rarely observed in human beings.[1] Although reported in connection with injections of vaccines (rabies, typhoid), antitoxin and toxin-antitoxin, this is the first report of a local anaphylactic reaction developing after injections of histaminase.[2]

Local anaphylaxis (the Arthus phenomenon) is the "inflammatory reaction which occurs when an animal immunized against a protein is reinjected with the same antigen—it is caused by the presence of an antibody in the blood stream and tissues of the immunized animal and occurs when antigen and antibody meet in tissues" (Opie). It is by most sharply differentiated from the Shwartzman phenomenon. It is possible for such antibodies to be present only in the tissues, i. e. tissue sensitization without the presence of antibodies in the blood stream. It is perhaps on this basis that the passive transfer test performed with the serum obtained from my first patient was negative—in fact the control showed more definite erythema than the presumably sensitized site of injection of the histaminase.

The time interval in case 1 (approximately twenty-eight days) between the first and second injection was of interest and may account for the more marked local reaction than that occurring in case 2.

At the present writing, eight other patients within the past six weeks have received at intervals of three or four days injections of histaminase without untoward reactions of any significance.

1. Vaughan, W. T.: Practice of Allergy, St. Louis, C. V. Mosby Company, 1939, p. 793.

2. The histaminase used was the product of the Winthrop Chemical Company: T 360. The ampule contains 2 units of histamine hydrochloride detoxifying units in the form of a dry sterile powder (renal and pig mucosal tissue), which for injection purposes is suspended in about 2 cc. of sterile physiologic solution of sodium chloride.

REPORT OF CASES

CASE 1.—A. L., a housewife aged 39 with acne vulgaris, was given into the left arm over the deltoid region on Feb. 19, 1940, a subcutaneous injection of histaminase. The day after this injection the patient left, unexpectedly, for Florida and did not return to the office until March 18, at which time she received another injection—the same dose of histaminase but in the subcutaneous tissue over the right deltoid. Within eight hours the arm became swollen from the shoulder to the elbow and there was some limitation in the movement of the right elbow. There was no elevation of temperature and the patient felt well except for a sense of tenseness due to the marked edema in the right arm. The next morning the arm was markedly swollen and the skin tense and hot over the area indicated. There was moderate tenderness and slight pain. There was no fever and no axillary adenitis. On the inner surface of the arm was an area of erythema the size of the palm of a hand but the remainder of the skin over the swollen arm showed only the changes incident to the tense, nonfluctuating subcutaneous edema. The patient was advised to use compresses of hot magnesium sulfate (a tablespoon to a quart of water) continuously. On the morning of the 20th she was seen again. The temperature the evening before had gone to 99 F. but on this morning was normal. A portion of the erythematous area the size of a silver dollar (38 mm.) had undergone wheal formation (at which site there was moderate pruritus) the night before but was now gone. A localized area of urticaria had actually developed. The swelling was moderately but definitely less, but the entire arm now itched and she was advised to continue the hot applications of magnesium sulfate. By the morning of March 22 the edema had disappeared to a marked degree. There was a mild, slightly tender axillary adenitis. There was some induration at the site of the injection. One week later I removed 10 cc. of blood and the next day started, with the serum, a passive transfer test. One tenth cc. of the serum was injected intracutaneously into the flexor skin of the left forearm; four days later a slightly smaller amount of histaminase solution was injected at the site of the serum injection and a control injection given into the flexor skin of the right arm. No reaction occurred although the patient was observed for one week.

CASE 2.—M. E., a nurse aged 35 with a deep form of acne vulgaris, was given an injection, March 15, 1940, subcutaneously into the left thigh. Four days later she received a second injection, the same dose, subcutaneously into the right thigh. Seen three days later the patient stated that swelling had developed at the site of the second injection twenty-four hours after it had been given. When I saw her the skin over the injected area had assumed an erythemato-urticarial appearance. The erythematous patch was an area 8 by 15 cm. and pruritic; twenty-four hours later the redness was gone, as was the swelling, but moderate pigmentation was present. On March 24 the patient was seen again and given one half the dose (i. e. one detoxifying unit) subcutaneously into the left thigh well above the site of the first injection. That night some redness developed over the injected area and from 2:30 to 6 a. m. severe abdominal cramps, nausea and diarrhea developed. She was so weakened that she remained in bed the entire following day. The patient, a dietitian at the hospital, did not attribute her gastrointestinal upset to any food she had eaten as the same food had been served to about 200 other hospital employees and nurses without any of them having any ill effects. March 29 the patient was given a fourth injection of 0.5 cc. of the solution (i. e. one fourth the dose). There was no untoward reaction. April 2, she was injected with one half the dose, and four days later, since there had been no reaction, a full dose was given and was well tolerated.

COMMENT

An interesting point in both cases is that the histaminase itself set up, albeit only locally, an urticarial type of reaction. Histaminase has been advised as a beneficial agent in urticaria. Can a substance producing an urticarial reaction be of value in the treatment of a similar objective symptom which has so many known causes or is one to believe in similia similibus curantur?

320 South Eighteenth Street.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE DRUG THERAPY OF CARDIAC ARRHYTHMIAS

ROBERT L. LEVY, M.D.
NEW YORK

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Irregularity of the heart beat is observed usually in association with organic cardiac disease but occurs not infrequently as a functional disturbance in the absence of structural lesions. It is due either to faulty initiation of the cardiac impulse or to its defective conduction through the heart. The arrhythmia may be transient or permanent. Effective treatment depends primarily on recognition of the cause. Drug therapy often brings about marked clinical improvement and, on occasion, may save life.

The use of medicinal remedies is not indicated in every disorder of rhythm or under all circumstances. For example, sinus irregularity, often marked in children, is of no pathologic significance. Premature contractions due to tobacco disappear when smoking is stopped. Auricular fibrillation, occurring in the course of hyperthyroidism, may terminate spontaneously after subtotal thyroidectomy. Five of the more important arrhythmias have been chosen for consideration because in each, as a rule, appropriate treatment with drugs is beneficial.

PREMATURE CONTRACTIONS

Many patients experience no discomfort from premature beats and are unaware of their occurrence. Others complain of palpitation or, more rarely, of precordial pain. This arrhythmia has been observed over a period of many years in persons in whom symptoms or signs of organic heart disease have not developed. The ectopic focus may be situated in auricles, junctional tissues or ventricles. Localization of the point of origin, possible only with the aid of the electrocardiograph, is immaterial for purposes of therapy. But an etiologic diagnosis is essential.

If the heart muscle is irritated by a toxic agent it is necessary only to eliminate the cause. The use of coffee, tea or tobacco can be discontinued. If the gallbladder is infected, its surgical removal is indicated. Recovery from nervous fatigue is aided by a respite from customary activities. Any drug, particularly digitalis, must be stopped if it is poisoning the myocardium.

Premature beats associated with emotional disturbances may disappear as the result of psychotherapy. A mild sedative is often helpful, such as one of the bromide salts, from 0.6 to 1 Gm. (10 to 15 grains), dissolved in a suitable vehicle and taken three or four times a day. Phenobarbital, from 0.015 to 0.03 Gm. (one-fourth to one-half grain) in tablet form, serves the same purpose. Sedation is discontinued as improvement takes place.

One of the early signs of myocardial insufficiency is the occurrence of ventricular premature contractions. Taking digitalis usually causes the irregularity to disappear. This drug is best given by mouth, as the whole leaf, dispensed in the form of tablets, pills or capsules. One digitalis unit[1] (approximately 0.1 Gm., or 1½ grains) of a biologically standardized product (such as digitalis pulverata, U. S. P.) is administered three times a day for four days, twice a day for three days and then once a day for a week. The required daily dosage and total amount will vary with each patient; the scheme outlined serves only as a guide. Full digitalis action, as required in the presence of advanced congestive failure, is not necessary. The drug may be stopped when regular rhythm has been established. Sometimes a continued maintenance ration is necessary to prevent relapse (from 0.05 to 0.2 Gm., or three-fourths grain to 3 grains daily). It must be kept in mind not only that digitalis will abolish premature beats but that this arrhythmia is one of the early signs of poisoning by the foxglove.

In cases of coronary atherosclerosis in which there is no evidence of cardiac insufficiency, areas of local myocardial ischemia not infrequently appear to initiate this type of irregularity. Digitalis is the most useful drug in abolishing it and is given as described for the treatment of early congestive heart failure.

Should digitalis be poorly tolerated, as happens on rare occasions, squill may be substituted in the form of the product marketed under the name "urginin." This preparation, composed of equal parts of two water-insoluble glucosides (scillonin A and B), has an action on the heart like that of digitalis. One 0.5 mg. ($\frac{1}{120}$ grain) tablet is the approximate equivalent in therapeutic activity in man of 0.1 Gm. (1 digitalis unit) of digitalis leaf. Urginin is frequently well taken by those in whom digitalis causes local digestive discomfort, but it possesses no other advantages.

Quinidine sulfate is another drug that is occasionally useful, but less so than digitalis. The dose is 0.2 Gm. (3 grains) three or four times a day, in capsule or tablet form. Phenobarbital, from 0.015 to 0.03 Gm. (one-fourth to one-half grain), may sometimes be given with quinidine to advantage. In my experience quinine is less effective than quinidine, and its efficacy is not enhanced by combining it with strychnine, as has been recommended.

AURICULAR FIBRILLATION

Auricular fibrillation is due to the establishment in the auricles of a circus movement, which travels at a varying but rapid rate over an irregular course, about the mouths of the great veins. The ventricular rate in an untreated case is usually fast. There are two ends to be achieved by drug therapy: first, to slow the rate of beating of the ventricles; second, under certain conditions which will be defined, to restore sinus rhythm.

Regardless of etiology, the ventricular rate, if rapid, must be retarded. This is accomplished by administering digitalis, which is effective in either the presence or the absence of congestive failure. Its action in slowing the ventricles is more pronounced in rheumatic and coronary heart disease than in hyperthyroidism, or in cases associated with toxemia due to bacterial poisons. Digitalis acts by depressing the conductivity of the junctional tissues and producing incomplete auriculo-

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1. U. S. P. XI (1936) digitalis is from 25 to 30 per cent stronger than the digitalis of the U. S. P. X (1926). The U. S. P. XI digitalis unit is also somewhat stronger than the Hatcher-Brody cat unit.

ventricular block. As a result, only part of the impulses from the auricles are permitted to reach the ventricles. The degree of block, and hence the ventricular rate, can be regulated by the amount of the drug given.

The total therapeutic dose of digitalis will vary according to the degree of cardiac insufficiency and the susceptibility of the individual. The amount necessary to induce a full effect in a person who has not previously taken digitalis is between 1 and 2 Gm. (15 and 30 grains), given in the course of two or three days. Usually 1 Gm. can safely be given in the first twenty-four hours in divided doses. In the second twenty-four hours 0.5 Gm. (7½ grains) may be administered. A suitable interval between doses is from four to six hours; but the rate of digitalization can be varied according to the urgency of the indications. Subsequent therapy will depend on the effect observed on ventricular rate, the ultimate aim being to lower this to a level ranging between seventy and eighty beats a minute, with the subject at rest.

In fibrillation of recent onset, sinus rhythm may be resumed after digitalis has been taken, owing to improvement in the function of the myocardium. If fibrillation persists, a daily maintenance ration should be continued. The patient with permanent auricular fibrillation must, as a rule, take digitalis for the rest of his life. The daily dose may be as little as 0.05 Gm. or as much as 0.3 Gm. The average is 0.1 Gm. Each case is the subject of experiment in this respect, with the ventricular rate, at rest, serving as guide.

After surgical operation or in the presence of nausea and vomiting, digitalis may be given by rectum, as the tincture or in a suppository. Absorption is good. The dosage is similar to that used by mouth. Intramuscular injections may be employed when oral or rectal routes are not available.

In rare cases an immediate slowing of rate seems imperative. Under these conditions crystalline strophanthin (ouabain), injected intravenously, is the preparation of choice, because its known chemical composition makes accurate dosage possible. An initial effect is apparent in from five to twenty minutes and a maximal effect in from fifteen to fifty minutes. At the first dose 0.5 mg. (1/120 grain) is injected; this is followed at intervals of one hour or more by 0.1 or 0.2 mg., up to a total dose of 1 mg. Treatment is then continued by giving a preparation of digitalis by mouth, by rectum or by intramuscular injection.

The toxic effects of digitalis are now well known. Nausea, vomiting, diarrhea and the occurrence of premature contractions are among the earlier evidences of poisoning. With larger doses, ventricular tachycardia may appear. As soon as any one of these is noted, the drug should be discontinued.

Restoration of normal rhythm can be brought about, in certain cases, by the use of quinidine sulfate. The number of patients suitable for receiving this drug is not large because of the dangers from its administration and the limitations in its effectiveness. Some persons experience tinnitus, nausea, vomiting or diarrhea as minor discomforts. More serious toxic effects are syncope, collapse, embolism, induction of cardiac insufficiency, ventricular tachycardia and, on rare occasions, sudden death. By careful selection of suitable cases the chance of success in altering the rhythm is increased and the possibility of grave accident is minimized.

Contraindications to the employment of quinidine are idiosyncrasy to cinchona derivatives, fibrillation of long standing, significant cardiac enlargement, mitral stenosis, active carditis, congestive heart failure, previous occurrence of emboli to lungs or systemic arteries, partial or complete heart block, bundle branch block and hyperthyroidism. Favoring its use are a competent myocardium, fibrillation of recent onset, little or no cardiac enlargement, no structural valvular defect and fibrillation persisting after subtotal thyroidectomy for hyperthyroidism. It is clear that quinidine is a drug which is to be given to a small group of patients.

Resumption of normal rhythm does not greatly improve the clinical status of most patients with organic heart disease and fibrillation of long standing (longer than six months). There is always the possibility, and indeed the probability, that fibrillation will recur, with sudden onset of a rapid ventricular rate. Another period of rest and therapy is then required. On the other hand, if the functional capacity of the heart muscle is good and the ventricular rate is held at a proper level by continued digitalis dosage, a more stable condition is maintained. Though the auricles continue to fibrillate, the patient can pursue his prescribed activity with comfort and freedom from upsetting episodes.

Cardiac insufficiency, when present, should be treated by suitable measures before quinidine is given. The ventricular rate, if rapid, is controlled by digitalis. But before quinidine is started it is well to stop the administration of digitalis, because its action favors persistence of the circus movement. Quinidine therapy should be carried out with the patient in bed under careful observation, preferably with electrocardiographic control. It is not a procedure applicable to ambulatory patients.

Several plans for dosage have been suggested and found satisfactory. One that can be recommended is as follows: Individual doses are given by mouth, in the form of capsules or tablets, at intervals of two hours. First day, two doses of 0.2 Gm. (3 grains) each; these are to test for possible idiosyncrasy to the drug. If symptoms of cinchonism appear, treatment is abandoned. Occasionally normal rhythm follows administration of such small preliminary doses. Second day, three doses of 0.4 Gm. (6 grains) each. Third day, four doses of 0.4 Gm. each. Fourth and succeeding days, five doses of 0.4 Gm. each. In a few cases from six to eight doses in a day have succeeded where five have failed, but the larger amounts are not without added risk. The treatment may be continued for a week; but usually, if success is obtainable, from four to six days of this dosage suffices. If it should prove necessary to continue beyond this period, normal rhythm, though sometimes restored, rarely persists for long. Intravenous injection of quinidine is inadvisable; several fatalities have followed this procedure.

After resumption of normal rhythm it is desirable to continue with small doses of 0.2 Gm. three times a day for several weeks. These aid in preventing relapse. Such amounts, or even larger doses (0.4 Gm. three or four times a day) may be taken for weeks or months without harm or discomfort. A similar plan may be followed, often with good results, in cases of paroxysmal fibrillation, to prevent the occurrence of attacks. If, however, these recur at frequent intervals, fibrillation is allowed to persist, and the ventricular rate is controlled by digitalis.

AURICULAR FLUTTER

As in fibrillation, the mechanism at the basis of flutter is a circus wave in the auricles. In flutter, however, the circus wave follows a fixed path at a constant rate.

Its speed determines the rate of auricular contraction, which ranges in different cases from 200 to 400 a minute. Depending on the degree of auriculoventricular block, the rate of the ventricles is rapid or slow.

If the ventricular rate is fast, digitalis is indicated and is the drug of choice. It is given in the same manner as that outlined for fibrillation. Following full dosage, the rhythm is usually converted into fibrillation. When this occurs, and if the ventricular rate is slow, digitalis is stopped. After the lapse of several hours, normal rhythm may be resumed without further medication. If, in spite of apparent digitalis action, the mechanism of flutter persists, quinidine may be tried. The plan of dosage is the same as that given for fibrillation. But, if the foxglove has failed, quinidine is rarely effective. Should flutter be converted to fibrillation and the latter continue, quinidine may be expected to restore normal rhythm. Paroxysmal flutter is much less common than paroxysmal fibrillation. The prophylactic use of small doses of digitalis or quinidine may be tried if attacks are sufficiently frequent to cause discomfort.

Occasionally auricular flutter is resistant to all drug therapy and the disordered mechanism persists. If the ventricular rate is controlled by digitalis and the myocardium is competent, patients can carry on their customary activities without discomfort. In several reported cases normal rhythm has been resumed spontaneously, for no apparent reason, after flutter had been present continuously for months or even years.

PAROXYSMAL TACHYCARDIA

Paroxysmal tachycardia is observed frequently, though not invariably, when there are no anatomic lesions in the heart. It is due to a rapid succession of ectopic beats arising in auricles, junctional tissues or ventricles, occurring regularly at rates ranging from 150 to 200. The onset and offset are sudden, and the patient is usually aware of both. The duration of a paroxysm is from a few hours to a number of days; spontaneous cessation is the rule. Prolonged tachycardia may result in cardiac insufficiency, especially when there is impairment of the myocardium due to disease.

The effectiveness of any particular form of therapy cannot be foretold; each case appears to vary in its response. The attacks may be short and require no treatment by drugs. Simple mechanical procedures to terminate them should first be tried, such as carotid or ocular pressure, forced breathing, leaning forward in a chair with the head low or forced breathing with the glottis closed. If tachycardia persists and the patient is distressed, a triple bromide tablet, 1 Gm. (15 grains), may be taken every four hours for several doses. Sometimes morphine sulfate, one-fourth grain (0.015 Gm.), allays discomfort and appears to aid in stopping the attack. If recurrences are frequent morphine should not be used repeatedly, because of the danger of addiction. I have seen one such instance.

If these measures are ineffectual, acetyl-beta-methylcholine chloride (mecholyl) may be injected subcutaneously in a dose of from 20 to 40 mg. (one-third to two-thirds grain). It acts by stimulating the vagus nerves. As a rule the attack ceases abruptly in from one to twelve minutes. The drug frequently causes unpleasant symptoms, among which are dyspnea, sweating, flushing and salivation; there may be vomiting and substernal pain. Some patients prefer the discomfort of the paroxysm to the distress caused by the remedy. Atropine sulfate 1.2 mg. (one-fiftieth grain), injected intravenously, will neutralize the effects of acetyl-beta-methylcholine chloride almost at once and may be given if the reaction is stormy. Acetyl-beta-methylcholine chloride, though not a dangerous drug, should be used cautiously for patients with asthma and those suffering from conditions responding to epinephrine, which is a physiologic antagonist of the cholines.

Syrup of ipecac, from 8 to 16 cc. (2 to 4 teaspoons), may be taken by mouth to induce nausea or vomiting. It produces reflex vagal stimulation and so can end a paroxysm. If the desired effect is not obtained after one hour, the dose may be repeated. The result is unpleasant but the procedure is simple and sometimes succeeds.

For prolonged attacks, especially if signs of cardiac insufficiency appear, digitalis should be given orally in full doses. It supports the failing heart and its use is often followed by cessation of the tachycardia. Injection of digitalis or strophanthin by vein is not without hazard, and the action is uncertain.

In some cases quinidine sulfate by mouth restores sinus rhythm. Doses of 0.4 Gm. (6 grains) are given every two hours until five or six have been taken. One or two doses may suffice. In tachycardia of ventricular origin, quinidine is particularly effectual. When the arrhythmia follows myocardial infarction, large amounts are sometimes necessary and are well tolerated. As much as 0.8 Gm. (12 grains) may be given every two hours for five, six or more doses. After coronary occlusion it is desirable to end the tachycardia promptly in order to spare the damaged heart muscle from doing added work. The intravenous injection of quinidine has been tried and, on occasion, has been effective. It is not recommended because of the danger of inducing sudden cardiac standstill.

The use of drugs to prevent the recurrence of attacks may be tried, but the result is uncertain. Quinidine sulfate in doses of 0.2 Gm. (3 grains) three or four times a day, is the remedy most likely to act prophylactically and, if effective, may be continued indefinitely. In some cases digitalis in full amounts, followed by a daily maintenance ration, appears to be a better preventive. When the attacks are precipitated by emotional upsets, sedatives such as the bromides or phenobarbital raise the threshold for disturbing influences and so lessen the tendency for setting off the "trigger mechanism."

COMPLETE AURICULOVENTRICULAR BLOCK

Like other arrhythmias, complete auriculoventricular dissociation may be transient or permanent. It is caused by diseases or drugs which prevent conduction through the junctional tissues. Lesions due to rheumatic fever, syphilis, coronary atherosclerosis or the toxin of diphtheria may regress with proper therapy, and normal conduction is resumed. The effect of digitalis wears off if its administration is stopped. Structural damage or functional impairment sometimes persists and heart block becomes permanently established.

Uncomplicated permanent block does not require treatment by drugs. If the heart muscle is functionally adequate, the circulation is not seriously handicapped by the slow ventricular rate (idioventricular rhythm). If congestive failure appears, it is treated in the usual manner, including the use of digitalis. When auriculoventricular block is complete, digitalis may even accelerate slightly the rate of beating of the ventricles. Quinidine is apt to exert a harmful action in the presence of heart block and should not be employed, even though the auricles are fibrillating.

Occasionally, long periods of ventricular standstill or paroxysms of ventricular fibrillation result in cerebral anoxemia and this, in turn, causes dizziness, syncope or convulsive seizures (Adams-Stokes syndrome). It is necessary to know which mechanism is responsible for the attacks in order to carry out appropriate therapy. If the attacks are associated with ventricular asystole and are frequent, epinephrine is the best preventive. It is given in doses of from 0.5 to 1 cc. (8 to 15 minims) of the 1:1,000 solution by subcutaneous or intramuscular injection. The dose may be repeated every two hours if necessary and continued for a day or more. On those rare occasions when ventricular standstill is markedly prolonged, intracardiac injection of epinephrine may save life. Epinephrine should not be used when the attacks are due to ventricular fibrillation, since its action favors the continuation of this mechanism.

If ventricular standstill tends to recur, ephedrine sulfate is sometimes partially or wholly effective as a prophylactic. Like epinephrine, it increases the irritability of the ventricular muscle. Ephedrine is given by mouth in doses of 30 mg. (one-half grain) three or four times a day and may be continued, if indicated, for weeks or months. Barium chloride and atropine sulfate have also been tried as preventives but are, in the experience of most observers, less effective.

730 Park Avenue.

Special Clinical Article

NUTRITIONAL DISEASES IN THE UNITED STATES

CLINICAL LECTURE AT NEW YORK SESSION

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During the past few years, attention has been increasingly focused on the problem of the recognition and treatment of nutritional diseases in this country. Ten years ago it was thought that we needed to concern ourselves only with rickets, pellagra and a little scurvy. Today it is recognized that all of the known nutritional diseases probably exist to some extent in the United States. Those that appear to be of most importance are anemia, due to iron or cobalt deficiency; nutritional edema, due to protein deficiency; hyperkerataosis and night blindness, due to vitamin A deficiency; beriberi and peripheral neuritis, due to thiamine (vitamin B_1) deficiency, frequently secondary to such conditions as alcoholism, pregnancy and diabetes; lip lesions, seborrhea and keratitis, due to riboflavin deficiency; pellagra or encephalopathy, due to nicotinic acid deficiency; swollen bleeding gums, skin and subperiosteal hemorrhages, due to ascorbic acid deficiency; rickets and osteomalacia, due to vitamin D deficiency; hemorrhagic disease of the newborn, due to vitamin K (phthiocol) deficiency; tetany, due to hypocalcemia, and probably many other at present less well identified conditions with a nutritional background. It is very difficult to estimate the prevalence of these diseases, since they usually do not figure prominently in physicians' reports, and the number of deaths reported is small.

From the National Institute of Health.
Read in the Medical Division of the General Scientific Meetings at the Ninety-First Annual Session of the American Medical Association, New York, June 11, 1940.

Just as a matter of interest, the reported deaths from a few of them as given by the United States Census Bureau for the period 1934-1938 are given in table 1. This table reveals some interesting facts. First, the total number of deaths from all these conditions is relatively insignificant except for pellagra. This fact has led the United States Public Health Service to put great emphasis on the prevention of this disease. The 1939 figures are not yet available from the Census Bureau, but it is to be expected that there were fewer deaths in 1939 because of the widespread use of nicotinic acid in treating this disease.

Another interesting fact to be seen in this table is the decrease in the number of deaths between 1934 and 1938 in all these diseases with the exception of beriberi. The number of deaths from beriberi in 1938 is about eight times that of 1934. Is this a real increase or is it due to better diagnosis and increased attention to this condition? There is no information available which will enable us to answer this question, although one is inclined to believe that at least part of the increase is due to better diagnosis. On the basis of the small total number of deaths per annum given in this table, in comparison with our approximately 30,000 annual deaths from diabetes, the first impression is that these diseases are relatively insignificant as a medical problem. However, it must be remembered that these are not killing diseases and the number of deaths affords little information with regard to the amount of sickness and disability. For example, iron deficiency anemia does not appear at all, yet Abbott and Ahmann [1] found that 50 per cent of 883 Florida rural school children were anemic, with hemoglobin values of 70 per cent (9.64 Gm.) or less; and some children with hemoglobin values even as low as 25 per cent were attending school. There was rapid regeneration of hemoglobin following the administration of iron and ammonium citrates to 200 children.

A few years ago it was estimated that the death rate from endemic pellagra did not exceed about 3 per cent on the basis of survey data collected by Goldberger and his associates [2] in 1917. This figure is probably too high today because of the number of lives now being saved by improved methods of treatment. On this basis, however, the 3,200 deaths from pellagra represent at least 100,000 cases—a figure which, in all probability, is an underestimate when the cases of nicotinic acid deficiency without cutaneous lesions as manifested by psychosis and encephalopathy are taken into consideration. There is much additional indirect information which indicates that the nutritional diseases are taking an enormous toll in illness and disability in this country. For example, Nelson [3] of the United States Food and Drug Administration estimates that in 1938 the people of the United States spent more than $100,000,000 for vitamin preparations manufactured or sold through pharmaceutic channels, or approximately $1 for every man, woman and child in the United States. In this connection the figures on the value of vitamin products manufactured in the United States in 1937, as obtained by the United States Department of Commerce [4] are given in table 2.

1. Abbott, O. D., and Ahmann, C. F.: Iron Deficiency Anemia in Children, Am. J. Dis. Child. **58**: 811 (Oct.) 1939.
2. Goldberger, Joseph; Wheeler, G. A.; Sydenstricker, Edgar, and King, W. I.: A Study of Endemic Pellagra in Some Cotton Mill Villages of South Carolina, Bull. 153, Hyg. Lab., U. S. P. H. S., 1929.
3. Nelson, E. M.: Governmental Control Problems in the Fortification of Foods with Vitamins and Minerals, Milbank Mem. Fund. Quart. **17**: 248, 1939.
4. Census of Manufacturers, 1937: Drugs and Medicines, United States Department of Commerce, Bureau of the Census, Feb. 3, 1939.

The value at the factory totals $26,898,500, which with the usual retail mark-up of 100 per cent represents $53,797,000 spent by the public for these preparations. It is of interest to note that the greatest expenditure, about $21,000,000, was by the general public on vitamin products which did not comply either with the United States Pharmacopeia or with the National Formulary. This figure for 1935 was only about $4,700,000. In other words, the business of self medication with vitamin preparations increased about fivefold in two years. Does this indicate a widespread prevalence of mild disability due to vitamin deficiencies or was this money

TABLE 1.—*Number of Deaths in Registration Area of United States* *

	1938	1937	1936	1935	1934
Scurvy	30	27	33	30	36
Beriberi	42	21	11	7	5
Pellagra	3,205	3,258	3,740	3,543	3,602
Rickets	244	235	270	261	292
Osteomalacia	16	17	17	12	21
Tetany	100	110	111	108	129

* As reported by the U. S. Census Bureau.

largely wasted? It probably is an indication of the success of advertising campaigns rather than sales due to real needs, since people with money enough to purchase such preparations do not constitute the large group of our population most likely to be getting a deficient diet. However, because of dietary fads and complicating diseases, undoubtedly some of this expenditure was worth while. Of more significance to us is the $13,114,000, representing about $26,000,000, expended on vitamin prescriptions prescribed by physicians. A figure of this magnitude must mean that physicians are becoming increasingly aware of the value of these preparations in treatment, and conversely that vitamin deficiency symptoms are widely prevalent. In addition it must be remembered that these figures, which are the latest available, are for 1937, before either nicotinic acid or riboflavin had come into wide medical use, and before much of the importance of these substances was recognized. Because of the money spent for these preparations the figure for 1939 probably will be much higher.

There is another line of evidence which indicates that the deficiency diseases may be very common and of great medical importance in this country. This evidence is based on food consumption studies.

While we have been improving our diets in some respects during the past century, they have been becoming more deficient in others. Stiebeling and Coons [5] show that during the past fifty years there has been a decline in the consumption of grain products and meats and an increase in the consumption of milk, green leafy vegetables, tomatoes and citrus fruits. Jolliffe [6] has pointed out that changes in wheat milling practice and decrease in grain consumption, which has been compensated by increased sugar consumption, has materially reduced the vitamin B_1 content of the American dietary during the past century. In addition to changes in dietary habits which have affected the nutritive value of the diets of most of us, there are two other important factors to be considered. The first of these is income. Under present conditions many people in this country cannot afford to purchase an adequate diet. Stiebeling and Phipard [7] have shown that city families with food expenditures of $1.25 a person a week have restricted diets, while with more money to spend for food the nutritive value of the diets improved. Hambidge [8] estimates that those who cannot now afford an economical fair diet are largely among those with incomes of less than $750 a year, a group which he estimates includes 32 per cent of all the families and single individuals in the United States; or, to put it another way, three out of every ten city and village families do not have enough money to spend for food to get a good, completely adequate diet.

The situation does not appear to be any better with regard to farm families, in spite of the fact that they usually produce part of their own food supply. Steibeling and Coons [5] state that farm families with money and nonmoney incomes under $1,000 a year scarcely included enough fruits and vegetables in their diets even in the summer months, and on the basis of figures from the National Resources Committee more than 60 per cent of the families of nonrelief farm operators in the Southeast and more than 40 per cent in the Northeast in 1935-1936 had total incomes, both money and nonmoney, of less than $1,000. They conclude, therefore, that a large proportion of farm family diets are poorly supplied with fruits and vegetables.

To this very large group of our population which apparently subsists on an inadequate diet because of low income must be added another group of undetermined size which obtains an inadequate diet because of ignorance, improper dieting, food faddism or carelessness in spending their food money, although their income is adequate to furnish a proper diet if the money were spent wisely. Without attempting to put any specific figure on the number of people affected, such data indicate that in all probability the nutritional diseases constitute our greatest medical and public health problem, not from the point of view of deaths, but from the point of view of disability and economic loss, a fact

TABLE 2.—*Value at Factory of Vitamin Products Manufactured in the United States in 1937* *

	Sold Directly to or Prescribed by Physicians	Specially Prepared Packages for Sale to General Public
U. S. P. or N. F.	$ 3,290,478	$ 3,191.618
Special formulas	9,823,530	.....
Not U. S. P. or N. F.	.....	10,592,884
Total	$13,114,008	$13,784,502

* As reported by the Bureau of the Census, U. S. Department of Commerce.

about which we have been misled by the very low death rate and inadequate diagnosis.

People who have studied the subject, therefore, are not surprised at the volume of the current sales of vitamin products, the increasingly large number of reports on the value of various vitamins for a wide variety of conditions or the increasing use of these preparations by practitioners. It is probable that the majority of all the patients coming to the general practitioner today are given vitamin or mineral preparations in some form in the course of their treatment with apparent benefit. Because of the lack of specific diag-

5. Stiebeling, Hazel, and Coons, Callie Mae: Present Day Diets in the United States, in Year Book of Agriculture, United States Department of Agriculture, 1939.

6. Jolliffe, Norman: A Clinical Evaluation of the Adequacy of Vitamin B_1 in the American Diet, Internat. Clin. **4**: 47 (Dec.) 1938.

7. Stiebeling, Hazel, and Phipard, E. F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities, Circular 507, United States Department of Agriculture.

8. Hambidge, Gove: Food and Life: A Summary in Yearbook of Agriculture, United States Department of Agriculture, 1939.

nostic methods and the vagueness and diversity of the symptoms, many physicians are likely to be careless in making an accurate diagnosis and in prescribing the proper specific therapy. It is essential that accurate diagnosis be made if treatment of the severer symptoms is to be adequate. Since as a rule large doses of the specific vitamin are necessary immediately, and frequently by parenteral injections, it may not be enough to try to solve the problem by giving some proprietary preparation reputed to contain all of the vitamins needed by man, beast or plant, since such preparations rarely have enough of any one substance to be of much therapeutic value. However, it is important also to recognize that frequently the symptoms of more than one nutritional disease are simultaneously present. This is to be expected because deficient diets are not likely to be deficient in only one factor; and, if the diet is deficient enough to produce symptoms of one deficiency, it is not unusual to find symptoms of another deficiency; or, if the diet is not improved along with specific treatment, symptoms of another deficiency may develop while the patient is under treatment. This is especially true of the members of the vitamin B complex, since these factors are usually found in varying amounts in the same foods. These deficiencies constitute a large part of our nutritional problem, the extent of which is not yet entirely clear because of the complexity of this group of substances. To date five members of this complex have been isolated, chemically identified and synthetically prepared. These are thiamine hydrochloride, nicotinic acid, riboflavin, pyridoxin (formerly called B_6) and pantothenic acid. In addition to these there are an uncertain number of others which are as yet unidentified, the importance of which for man has not been determined. When it is remembered that the value of nicotinic acid was discovered only late in 1937, the phenomenally rapid progress that has been made in this field can be understood. At that time only pellagra and beriberi were being recognized. The next syndrome to be identified was that of human riboflavin deficiency, which was recognized by Sebrell and Butler [9] as a separate entity late in 1938 and we are still learning things about it. The symptoms of this deficiency appear to be identical with those previously described as pellagra sine pellagra, but identification became possible only after both nicotinic acid and riboflavin were made available. The typical lesion is a macerated linear fissure in each angle of the mouth, designated by earlier writers as angular stomatitis. Accompanying this the lips become scaly, appear "chapped" and have a shiny reddened, denuded appearance. For this reason it is preferable to call the entire lip lesion a cheilosis. Along with the lip lesion there is a mild, greasy, seborrheic dermatitis on a slightly erythematous base at the nasolabial folds and in some cases at the inner or outer canthi. In many cases there is also a crusty, superficially eroded lesion just inside the nares and there may be a vertical fissure at the mucocutaneous junction. Occasionally the seborrheic dermatitis is also seen about the ears or on the face and may involve other parts of the body. In addition the tongue becomes a magenta color, which can be distinguished from the bright red tongue of pellagra. These lesions may persist for months unless a correct diagnosis is made and riboflavin therapy started. Within the past few months it has been recognized that a keratitis also occurred in many cases of this kind and that the keratitis would respond rapidly to riboflavin treatment.

Eye lesions in experimental animals with riboflavin deficiency have been noted by many observers. Goldberger and Lillie [10] saw "ophthalmia" in rats on diets which are now recognized to be deficient in riboflavin. Day and his associates [11] have made several reports on the relationship between cataracts and riboflavin deficiency in rats, and Bourne and Pyke [12] saw cataracts and keratitis in rats on riboflavin deficient diets. Bessey and Wohlbach [13] and Eckardt and Johnson [14] have reported a high incidence of keratitis in rats on riboflavin deficient diets, and Bessey and Wolbach [13] found vascularization of the cornea to be the earliest and most constant manifestation of riboflavin deficiency in the rat. O'Brien [15] also noted lesions of the iris and mydriasis in his rats, and El-Sadr [16] noted corneal infiltration (pannus), corneal ulcers and cataracts in rats on riboflavin deficiency and found that the corneal opacity disappeared within a few hours after a single dose of 50 micrograms of riboflavin.

In addition to this evidence from animal experimentation there are many references to eye lesions associated with deficient diets in human beings which may have been related to riboflavin deficiency. The very early writers on pellagra, such as Soler [17] in 1791 and Rampoldi [18] in 1885, refer to such eye symptoms as inflammation of the cornea, corneal ulcers and opacities, and among the early writers on pellagra in this country Clark [19] in 1909 reported pain in the eyes, conjunctivitis, failing vision and iritis, and Whaley [20] saw photophobia, mydriasis and superficial inflammation of the cornea among other eye lesions in pellagrins. It seems not unlikely now that, in view of the close association frequently seen between riboflavin deficiency and pellagra, many of these lesions may have been due to riboflavin deficiency. Last year Spies, Vilter and Ashe [21] again called attention to such lesions and stated that more than 70 per cent of the patients in their nutrition clinic with frequent recurrences of pellagra, beriberi or riboflavin deficiency also have visual disturbances, some of which are characteristic of vitamin A deficiency. They noted bulbar conjunctivitis, lacrimation, burning of the eyes and failing vision which in some instances responded to riboflavin therapy, although they saw similar lesions respond to large doses of carotene. Spies, Bean and

9. Sebrell, W. H., and Butler, R. E.: Riboflavin Deficiency in Man: A Preliminary Note, Pub. Health Rep. **53:** 2282 (Dec. 30) 1938; Riboflavin Deficiency in Man (Ariboflavinosis), ibid. **54:** 2121 (Dec. 1) 1939.

10. Goldberger, Joseph, and Lillie, R. D.: A Note on An Experimental Pellagra-like Condition in the Albino Rat, Pub. Health Rep. **41:** 1025 (May 28) 1926.

11. Day, P. L.; Langston, W. C., and O'Brien, C. S.: Cataract and Other Ocular Changes in Vitamin G Deficiency; Experimental Study on Albino Rats, Am. J. Ophth. **14:** 1005 (Oct.) 1931. Day, P. L., and Langston, W. C.: Further Experiments with Cataract in Albino Rats Resulting from the Withdrawal of Vitamin G (B_2) from the Diet, J. Nutrition **7:** 97 (Jan.) 1934. Day, P. L.; Darby, W. J., and Langston, W. C.: Identity of Flavin with Cataract-Preventive Factor, J. Nutrition **13:** 289 (April) 1937.

12. Bourne, M. C., and Pyke, M. A.: Occurrence of Cataract in Rats Fed on Diets Deficient in Vitamin B_2, Biochem. J. **29:** 1865 (Aug.) 1935.

13. Bessey, O. A., and Wolbach, S. B.: Vascularization of the Cornea of the Rat in Riboflavin Deficiency, with a Note on Corneal Vascularization in Vitamin A Deficiency, J. Exper. Med. **69:** 1 (Jan.) 1939.

14. Eckardt, R. E., and Johnson, L. V.: Nutritional Cataract and Relation of Galactose to Appearance of Senile Suture Line in Rats, Arch. Ophth. **21:** 315 (Feb.) 1939.

15. O'Brien, C. S.: Experimental Cataract in Vitamin G Deficiency, Arch. Ophth. **8:** 880 (Dec.) 1932.

16. El Sadr, M. M.: Eye Lesions Associated with Riboflavin Deficiency in Rats, Chem. Industry **58:** 1020, 1939.

17. Soler: Osservazione medico-pratiche che formano la storia esatta di una particolar malattia chiamata pellagra, Venice 1791; cited by Harris, H. F.: Pellagra, New York, Macmillan Company, 1919.

18. Rampoldi, R.: La Pellagra e il mal d'occhi, Ann. di ottal. **14:** 99, 1885; cited by Harris: Pellagra.

19. Clark, A. B.: Diseases of the Eye in Pellagra, Tr. Nat. Conf. on Pellagra, Columbia, S. C., 1910, p. 275.

20. Whaley, A. M.: Eye Symptoms of Pellagra, Tr. Nat. Conf. on Pellagra, Columbia, S. C., 1910, p. 279.

21. Spies, T. D.; Vilter, R. W., and Ashe, W. F.: Pellagra, Beriberi, and Riboflavin Deficiency in Human Beings: Diagnosis and Treatment, J. A. M. A. **113:** 931 (Sept. 2) 1939.

Ashe [22] noted a history of "visual disturbances" in patients with other symptoms of riboflavin deficiency, which disappeared in from four to six days following the administration of riboflavin. Pock-Steen [23] has reported that symptoms of photophobia, dimness of vision, mydriasis and keratitis in 109 patients with sprue were cured by riboflavin. Therefore, without attempting to give an exhaustive review of the literature it may be stated that a variety of eye symptoms have been associated with deficient diets for a long time. Within the past few months much additional light has been thrown on the subject by the contributions of Kruse, Sydenstricker, Sebrell and Cleckley.[24] Forty-seven patients with riboflavin deficiency showed slit lamp evidence of a vascularizing keratitis, accompanied by such symptoms as photophobia, dimness of vision, circumcorneal injection and a burning sensation of the eyeball. Gross injection of the vessels of the fornix and sclera without evidence of infection gave the picture of conjunctivitis; some showed corneal opacities, mydriasis and iritis. There was spectacular improvement in these symptoms following the administration of from 5 to 15 mg. of riboflavin daily. At the same time repeated slit lamp examinations showed rapid resolution of the keratitis and emptying of the vessels in the cornea. It was then demonstrated that the vessels on the cornea would refill with blood following withdrawal of riboflavin, and again could be made to collapse by giving riboflavin. This discovery that a keratitis is the eye lesion in man associated with riboflavin deficiency is in accord with the lesions demonstrated by Bessey and Wolbach on the rat and is supported by the more recent observations of Johnson and Eckardt [25] that riboflavin is of value in rosacea keratitis.

It therefore appears that at least some of the many cases of keratitis in this country of vague or unexplained etiology, even without lip or tongue lesions, are due to riboflavin deficiency. This work indicates that unrecognized riboflavin deficiency is perhaps very widespread in this country and is another indication of the probable extent of nutritional diseases.

Other recent work on the therapeutic application of vitamins to other conditions such as the use of vitamin E (alpha-tocopherol) in the treatment of muscular dystrophy or amyotrophic lateral sclerosis reported by Wechsler,[26] Bicknell [27] and Stone [28] and the use of vitamin K in hemorrhagic diseases of the newborn by Waddell and Guerry [29] are continually widening the field of clinical application of these substances. With constantly improving methods of early diagnosis of deficiency states revealing deficiencies hitherto unexpected by the clinician, and with intensive studies of the application of the newly available pure vitamin preparations to conditions of questionable etiology rapidly revealing new therapeutic uses, physicians are becoming increasingly aware of the magnitude of the field, and of the many problems yet to be solved. Here is, indeed, one of the most fruitful fields of medical investigation, and one which is advancing so rapidly that it requires constant reading to keep up, and I want to close with the statement that the prevention and proper treatment of the nutritional diseases constitute one of the greatest medical problems in this country today.

22. Spies, T. D.; Bean, W. B., and Ashe, W. F.: Recent Advances in the Treatment of Pellagra and Associated Deficiencies, Ann. Int. Med. **12**: 1830 (May) 1939.

23. Pock-Steen, P. H.: Eye Symptoms in Patients with Leiodystonia and Sprue: Aknephaskopia, Geneesk. tijdschr. v. Nederl. Indië **79**: 1986 (Aug. 8) 1939; abstr. J. A. M. A. **113**: 2102 (Dec. 2) 1939.

24. Kruse, H. D.; Sydenstricker, V. P.; Sebrell, W. H., and Cleckley, H. M.: Ocular Manifestations of Ariboflavinosis, Pub. Health Rep. **55**: 157 (Jan. 26) 1940. Sydenstricker, V. P.; Cleckley, H. M.; Sebrell, W. H., and Kruse, H. D.: The Ocular Manifestations of Ariboflavinosis: A Progress Note, J. A. M. A. **114**: 2437 (June 22) 1940.

25. Johnson, L. V., and Eckardt, R. E.: Rosacea Keratitis and Conditions with Vascularization of Cornea Treated with Riboflavin, Arch. Ophth. **23**: 899 (May) 1940.

26. Wechsler, I. S.: Recovery in Amyotrophic Lateral Sclerosis Treated with Tocopherols (Vitamin E): Preliminary Report, J. A. M. A. **114**: 948 (March 16) 1940.

27. Bicknell, Franklin: Vitamin E in the Treatment of Muscular Dystrophies and Nervous Diseases, Lancet **1**: 10 (Jan. 6) 1940.

28. Stone, Simon: The Treatment of Muscular Dystrophies and Allied Conditions: Preliminary Report on Use of Vitamin E (Wheat Germ Oil), J. A. M. A. **114**: 2187 (June 1) 1940.

29. Waddell, W. W., Jr., and Guerry, DuP. III: Effect of Vitamin K on the Clotting Time of the Prothrombin and the Blood with Special Reference to Unnatural Bleeding of the Newly Born, J. A. M. A. **112**: 2259 (June 3) 1939.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

PROGRESS REPORT OF THE CONSULTANTS ON AUDIOMETERS AND HEARING AIDS OF THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION

Significant progress and advancement in the science of acoustics have led to a definite improvement in all the industrial and professional phases of hearing aids and audiometers. For example, in the advent of the thermionic tube a new method of measuring the acuity and range of human hearing is placed at the disposal of the medical profession. This method provides a means whereby controlled tones, with respect to intensity and pitch, can be applied to the human ear and a permanent record made of the hearing. Far more accurate is this method than the ones it superseded where tuning forks, acumeters, whistles or watches were used.

Even though much scientific progress has been made, many difficult problems face those who endeavor to aid the deafened. In instances in which acquiring a hearing aid may help, both the otologist who recommends wearing an instrument and the manufacturer who sells it must seek to overcome a peculiar type of resistance in the deaf person. Although hearing aids become less noticeable as they diminish in size they still are quite visible, and in some instances there seems to be retained some vestige of the sardonic situations associated with the old fashioned ear trumpet. A sensitive person sometimes refuses to wear the device or, if he does, he does so reluctantly and as a last resort. False pride, therefore, hinders some in becoming adapted to the use of a good hearing aid.

Some years ago, much the same type of resistance was met by the ophthalmologist who recommended the wearing of eye glasses. This resistance has not entirely vanished, but today glasses usually are worn readily by those requiring them. The problems of the person who should wear a hearing aid and of those who must wear glasses are not altogether parallel; however, the common acceptance and wearing of glasses would seem to indicate that, in the future, hearing aids will become more commonly accepted and generally worn. Before the instruments reach a desired perfection and do gain this acceptance, many problems confronting the otologist and the manufacturer of audiometric equipment must be met and solved.

Although audiometers of reliable construction had been marketed for many years, no standards for the instruments had been fixed or generally accepted, and although the Council on Physical Therapy had considered hearing aids for inclusion on its list of accepted devices, no great progress in the art of helping the deafened had been made. In 1935 it was observed by the late Dr. Austin A. Hayden, Secretary of the Board of Trustees of the American Medical Association, that an efficient procedure might be for the Council to appoint a group of consultants, having special training and experience in the field, to assist in setting up minimum requirements for acceptance of audiometers and hearing aids and to help in the consideration of them as well as the conservation of hearing. His recommenda-

tion to the Board of Trustees that such a group be appointed was supported by Drs. Thomas S. Cullen, Ralph A. Fenton and the late Charles Wright, members of the Board of Trustees who had a special and personal interest in the problem. In 1936 the Council was authorized to appoint a group of consultants for this purpose.

Appointed as consultants on Dr. Hayden's recommendation were Drs. George M. Coates, Lee W. Dean, Edmund P. Fowler, Isaac H. Jones, Douglas Macfarlan, Horace Newhart, Burt R. Shurly and William P. Wherry. C. C. Bunch, Ph.D., took over the work of Dr. Dean at the latter's request, and Dr. C. Stewart Nash was appointed as a consultant in July 1939. At the first meeting Dr. Newhart moved that Dr. Hayden be appointed chairman and he was duly elected. Paul Sabine, Ph.D., of the Riverbank Laboratories, and W. C. Beasley, Ph.D., of the United States Public Health Service, have given generous assistance to the Council.

In order that the special problems facing those interested in prescribing and making hearing aids available to the deafened might be more clearly understood and effectively handled, it was considered necessary to pursue a course especially suited to dealing with the problems. What proved to be a very effective method of promoting mutual understanding between otologists and hearing aid manufacturers was a series of joint meetings of representatives of each group. Hence, according to the minutes of the Board of Trustees, by motion of Dr. Hayden, seconded by Dr. Wright, funds were made available for holding the first of the conferences, where the consultants met with the manufacturers of audiometers and hearing aids. Since then the Board has continued its cooperation with the Council and consultants in authorizing additional appropriations to carry out this special program.

A conference of this nature is not amenable to the procedure of the Council on Physical Therapy because of time limitations when the Council holds its meetings. However, the Council felt that such a meeting would be of great value for the consultants in evaluating all the phases of the problem. Personal contacts of this kind between the consultants and representatives of the manufacturers have proved very useful; several consultants and the Secretary of the Council have also made inspection visits to plants where the instruments are manufactured. In all, three meetings have been held with most creditable results.

The first of the meetings, held at the Palmer House in Chicago, Aug. 8, 1937, provided an opportunity for each manufacturer of audiometers to acquaint the consultants with his unit through an actual demonstration of the apparatus. The advantages and limitations of each unit, and the extent to which it met the tentative requirements, were discussed. The great value of this meeting lay in the fact that it made it possible for the consultants to obtain better insight into the problems confronting the manufacturers of the instruments and it revealed to the manufacturers the difficulties otologists encountered in testing hearing and using the information in clinical practice.

The Council and the consultants had been of assistance to the American Standards Association subcommittee when that group formulated its Tentative Minimum Specifications for Audiometers for General Diagnostic Purposes. These specifications provided an excellent groundwork for the compilation of the Council's minimum requirements. However, a conference between the consultants and the representatives of audiometer and hearing aid manufacturers and voluminous correspondence were required before the adoption and publication of the Council's Tentative Minimum Requirements for Acceptable Audiometers. The publication date was Nov. 27, 1937.

The second joint meeting with the consultants and the manufacturers was also held at the Palmer House in Chicago; it took place Aug. 20, 1938. The Tentative Minimum Requirements for Acceptable Audiometers were considered further. Specifications for acceptable hearing aids, and the practicability of using the audiogram in fitting them, were also discussed. The claims made in advertising and the promotion of hearing aids were also considered. Both the consultants and the manufacturers were afforded a clearer conception of the problems of each by this discussion.

At the third joint meeting with the consultants and representatives of hearing aid manufacturers, held May 5, 1940, the Minimum Requirements for Acceptable Audiometers were reviewed and the Tentative Minimum Requirements for Acceptable Electric Hearing Aids were given consideration. Several minor changes were made in each. Advertising claims advanced by the manufacturers for their instruments were discussed. Trial periods for prospective hearing aid purchasers were given consideration.

By far the greatest volume of the work and the majority of the deliberations have been carried on by correspondence. From time to time, usually once a month, communications or confidential bulletins are sent to the consultants from the A. M. A. headquarters in Chicago. Embodied in these mimeographed communications are reports, discussions and votes on the matter before the consultants. The questions are arranged so that ample space is given for discussion, criticism and voting. Questions are worded so that they recommend to the Council certain actions. The Council then acts on these recommendations, either accepting or not accepting them. Since the appointment of the consultants three years ago thirty-four communications, or about 600 pages of single spaced copy, have been sent to each of the members. An enormous quantity of advertising material has also been presented to them for review and criticism.

On Feb. 25, 1939, the Minimum Requirements for Acceptable Audiometers were published. Three audiometers have been accepted: the Maico Audiometer D-5, the Western Electric Audiometer 6B and the Jones-Knudson Audiometer, which is no longer on the market because of excessive cost of production. Other audiometers are before the Council and are still undergoing consideration. More recently the Council has considered the possibility of compiling minimum requirements for acceptable audiometers used for group screening tests. Two screening audiometers, a phonograph type and an oscillator type, have been submitted to the Council. For the first time in history real standards for audiometers to test hearing are available.

Although the Council had considered hearing aids prior to the appointment of the consultants in 1936, one hearing aid having been placed on the list of accepted devices in 1935, after the consultants became active much greater progress was made. There are now eleven hearing aids on the Council's list of accepted devices; seven are of the carbon granule type, two of the vacuum tube and two of the semiportable type. The accepted hearing aids are the Acousticon Hearing Aid, Coronation Acousticon Hearing Aid, Aurex Hearing Aid (semiportable), Radioear, Radioear De Luxe Type B-20, Maicophone Hearing Aid (vacuum tube), Ravox Hearing Aid (semiportable), Sonotone Hearing Aid, Telex Hearing Aid (vacuum tube), Western Electric Audiphone and Western Electric Audiphone, Ortho-Technic Model. Six hearing aids of the vacuum tube type are now undergoing consideration.

It is the opinion of the consultants, as expressed by Dr. Nash, that hearing aids should be fitted by otologists after a complete otologic examination including the inspection of aural polyps and the tympanic cavities for carcinoma or tumor, and audiometric test, tuning fork, voice and whisper test. The physician is in a better position to analyze the wants of a deafened patient than a technician or salesman. He will know whether lip reading instruction, a surgical operation or the application of a hearing aid is the correct way to solve the patient's problem. When a hearing aid is prescribed or fitted, Dr. Macfarlan points out that the otologist is better trained to test the efficiency of the aid by voice tests using words, syllables and meaningless phrases. However, the consultants feel that this is not the time to lay down any hard and fast rules to the effect that no aid should be sold without an otologic evaluation and physician's prescription.

Requests from insurance companies, courts of law, compensation boards and other interested groups have been brought to the attention of the consultants concerning the need of standardized tests for determining hearing loss and a method for estimating hearing loss in terms of percentage. At the annual session of the American Medical Association in St. Louis in 1939 the House of Delegates approved the program outlined by the Council to meet requests. This problem is now being considered by the Council and consultants.

When one special field of medicine comes to another with a controversial question, as pointed out by Dr. Wherry, each side

is aware of the difficulties involved in formulating a clearcut, definite answer, and the profession accepts a tentative answer which may be subject to revision. However, when industry comes to medicine with a question on a controversial subject, industry will be satisfied with nothing but a definite answer. As the question of ear impairment and percentage loss concerns industry through the compensation boards, courts of law and insurance companies, the answer given by the Council and consultants to this problem of the standardization of tests for hearing loss and the estimation of loss in terms of percentage must be clearcut and definite. As this is a highly controversial question, involving the combination of many variables that must be reduced to a common denominator, ample deliberation must be given to it before a final answer is made.

The Section on Ophthalmology of the American Medical Association has developed a method for estimating the visual acuity in terms of percentage; this method has been adopted by the House of Delegates. Many states have officially adopted it as the method of estimating visual loss. Industrial surgeons practicing orthopedic surgery have made significant advances in the estimation of percentage loss of movements caused by damage to extremities. The consultants and the Council are doing the same with hearing impairment.

A special committee of the consultants, comprised of Drs. Bunch, Hayden, Nash, Newhart, Sabine and Wherry, has been formed to deliberate on this question. Two methods for estimating the loss of hearing in terms of percentage are now being considered by the committee. One method was proposed by Dr. Bunch and the other by Dr. Fowler. Although they have been carefully considered for several months, a final decision has not yet been reached and it is the opinion of the committee that the acceptable method will involve some of the points of each of the proposed methods. More study will be required before the consultants and the Council can adopt a recommendation for estimating the loss of hearing in terms of percentage.

The consultants have given consideration to the problem of developing acceptable screening audiometers for use in schools, industrial plants and other institutions. The great value in the periodic testing of hearing of public school children in the prevention of deafness of any scale has often been pointed out by Dr. Newhart. Dr. Jones has written about the audiometer and its place in the educational field especially in the public schools. Dr. Shurly has demonstrated how the family physician may be consulted in connection with the information obtained from screening tests made in the public schools at Detroit. Although the consultants are giving consideration to the drawing up of minimum requirements for acceptable screening type audiometers, the data now available are not definite enough on which to build.

Part of the activities of the consultants have been devoted to education such as making available significant information on the clinical use of the audiometers, on how to take an audiogram and on the construction of the instrument. Thus the Secretary of the Council has presented exhibits at annual sessions of the American Medical Association and at meetings of the American Academy of Ophthalmology and Oto-Laryngology. These exhibits have been designed purposely to explain by means of demonstrational apparatus the makeup of physical characteristics of audiometers and hearing aids.

What is more important in education is instruction regarding the prevention of deafness. The program advanced several years ago by Dr. Coates on the prevention of deafness among industrial workers is still as sound today as it was then. Many of the consultants have given courses and exhibits at the annual meetings of the American Academy of Ophthalmology and Oto-Laryngology and read papers before the American Otological Society, the American Laryngological, Rhinological and Otological Society, Inc., and the Section on Laryngology, Otology and Rhinology of the American Medical Association.

The work of the Council and its consultants has been recognized by the American Society for the Hard of Hearing in that this organization has voted to place for publication in *Hearing News* after January 1941 only hearing aids accepted by the Council.

The consultants and the Council have not been without criticism. An apparent variation on different clinical audiometers due to calibration has been noted by several observers. This variation arises in the amount of energy required for the threshold of hearing and also by the fact that the energy required for a threshold has not been fixed definitely by any authoritative body. Hence the consultants supported by the representatives of manufacturers will request the National Bureau of Standards to establish a standard threshold level as soon as possible.

It has been pointed out by Dr. Willis C. Beasley in connection with the work of the United States Public Health Service national health survey that sufficient information should be available to fix the standard for the threshold of hearing. Dr. Bunch has duplicated these results independently. It is believed that, together with U. S. Public Health Service data and the data collected at the Bell Telephone Laboratories' exhibit at the New York World's Fair, there are sufficient data to peg the threshold. It is relevant to add that the audiometers on the accepted list are calibrated to a threshold which will not be far from the ultimate accepted one. Various agencies have been working together for some time and thus agreement in opinion will probably not be difficult to achieve.

The Council has been questioned concerning the delay in the publication of acceptance reports of audiometers. One of the chief reasons for the delay was that the manufacturers of audiometers were apparently unable to meet the requirements which they themselves assisted in setting up and agreed as being just and reasonable. Another obstacle was the controversy over requirements with respect to purity of tone and maximum of intensity.

An explanation as to the delay in the adoption and publication of the requirements for acceptable electrical hearing aids also appears to be indicated, as there have been many requests for these requirements. Much advancement and many changes in the manufacturing phase are constantly occurring, and, in the opinion of the Council and the consultants, to set up restricting and unadaptable requirements would be a greater detriment to progress than not to set up any requirements at all. Tentative Minimum Requirements for Acceptable Hearing Aids were published in THE JOURNAL, May 11, 1940, and they are expected to go into effect in January 1941. These requirements are not to be interpreted as standards.

The procedure of the Council on Physical Therapy in the consideration of an audiometer or hearing aid is as follows: The Council on Physical Therapy is a standing committee of the Board of Trustees and its duties are to consider apparatus offered to the medical profession for diagnostic or therapeutic purposes, to study any methods of therapy involving physical agents (chemical agents excluded) and to assist in making such information available to the profession.

The members of the Council on Physical Therapy, as well as the consultants on audiometers and hearing aids, serve without remuneration. The Council members give consideration to and vote on questions submitted to them in the Council's confidential bulletin.

The booklet "Official Rules of the Council on Physical Therapy" is sent to the manufacturer of an audiometer or of a hearing aid who desires the Council's consideration of his instrument. The firm is asked to comply with the requirements given on the last two pages of the booklet and to submit a report from a qualified laboratory relative to the performance of the instrument, being guided by the Minimum Requirements for Acceptable Audiometers or by the Minimum Requirements for Acceptable Hearing Aids as the case may be.

The evidence submitted by the manufacturer is sent to an independent and impartial laboratory acceptable to the Council, where it is checked. If confirmed, a report is prepared recommending acceptance. If, however, the evidence submitted by the firm is not confirmed, a report of rejection is prepared and after adoption by the consultants and the Council it is sent to the manufacturer for his information prior to publication.

The final decisions of the Council concerning the acceptability or nonacceptability of audiometers and hearing aids along with other actions of the Council are published in THE JOURNAL from time to time under the Council's proceedings. The Council also edits a booklet entitled "Apparatus Accepted" in which audiometers and hearing aids are listed along with other apparatus having been accepted and placed on the list of accepted devices.

CONCLUSION

The Council on Physical Therapy and the Consultants on Audiometers and Hearing Aids have made the following advancements in the consideration of audiometers and hearing aids and the conservation of hearing:

1. Minimum requirements for acceptable audiometers have been formulated and adopted. The requirements have received universal acceptance on the part of otologists and manufacturers.

2. Three audiometers for diagnostic use have been investigated and accepted.

3. Requirements for acceptable hearing aids have been formulated and adopted.

4. Hearing aids have been investigated and accepted or rejected and this information has been made available to the profession and the public.

5. A survey of methods for determining the percentage of disability due to deafness has been started. The House of Delegates at the St. Louis session endorsed the work accomplished and objectives aimed at.

6. Information on devices used for treatment of hearing loss has been made available (e. g., stimulation of hearing by sound).

7. Advertising of acceptable hearing aids and audiometers has been reviewed, considered and criticized and much undesirable copy has been eliminated.

8. The Council has assured high standards of construction, workmanship and material.

Finally, the Council desires to express its appreciation to the Consultants on Audiometers and Hearing Aids for the valuable assistance that has been rendered by them for the past two years, and also to the several general and special medical societies for their cooperation.

SEARS S-4 SUNLAMP ACCEPTABLE

Manufacturer: Northern Electric Company, 5224 North Kedzie Avenue, Chicago.

Distributor: Sears, Roebuck and Company, Chicago.

The Sears S-4 Sunlamp produces ultraviolet radiation and consists of a standard mazda S-4 type bulb together with a standard reflector following the curvature and reflection specifications. The bulb is mounted in a socket permanently fixed in a socket housing which also holds the reflector, so that at all times the bulb will be at the proper location with reference to the reflector. The complete assembly of the bulb, reflector and socket are fixed to an adjustable standard mounted in a cast iron base which encloses the transformer.

The type S-4 mazda sunlamp consists of an electric arc discharge through mercury vapor between activated metal electrodes sealed in a small quartz capillary tube which, in turn, is enclosed in a bulb of special glass that is opaque to ultraviolet radiation of short wavelengths.

The radiation passing through the quartz capillary tube is essentially that of the so-called "hot quartz" mercury arc. However, by inclosing the quartz lamp in a bulb of glass of a composition and thickness to absorb completely the intense emission lines of wavelengths shorter than about 2,800 angstrom units, there remains a series of strong emission lines at 2,894, 2,967, 3,024 and 3,132 angstrom units (and longer wavelengths) favorably situated in the spectral band of ultraviolet in sunlight recognized as having a specific therapeutic effect, especially in curing rickets.

Operation: The S-4 lamp is operated on the ordinary (115 volts) house lighting (A. C.) circuit, but it requires an intermediary, especially designed, transformer to maintain the proper voltage and operating temperature. The approximate power used is 100 watts. In the lamps tested, on 115 volts input, the current through the lamp ranged from 2.1 to 2.3 amperes.

Radiation Measurements: In order to determine whether the type S-4 lamp complies with the Council's requirements of acceptability as a sunlamp, spectral ultraviolet radiation measurements were made in a laboratory selected by the Council. These measurements showed that the radiation of wavelengths shorter than 2,800 angstrom units is immeasurably small.

In this investigation the lamp was placed close in front of the quartz-fluorite achromatic spectroradiometer, and the spectral intensities were measured with a vacuum thermopile. The relative spectral intensities (galvanometer deflections) corrected for absorption in the spectroradiometer are given in the accompanying table:

Wavelengths (Angstrom Units)	Relative Energy (Average of 3 Lamps) Microwatts per Square Cm.
3,132	7.96
3,024	2.59
2,967	1.15
2,894	0.28
2,804	0.09
Total	12.07

The radiation at 2,804 angstrom units (and shorter if measurable) is about 0.75 per cent of the total of all wavelengths, including 3.32 angstrom units and shorter. Mounted in an aluminum reflector the radiation at 2,804 angstrom units and shorter, relative to the total, would be still lower. Hence, these lamps comply with the Council's requirements for acceptability of a sunlamp for spectral quality of ultraviolet radiation.

Erythema Test: The untanned inner side of the upper arm, at a distance of 24 inches (61 cm.) from the lamp in an aluminum reflector, was exposed to lamp #12 on 108 volts for intervals of two, four, six, eight, ten, twelve and fifteen minutes. A mild erythema was obtained on six minutes' exposure. Exposures of eight minutes and longer were too long—the exposed part was still red after three days. With a standard voltage (115) and a modern reflector, the exposure time for an minimum perceptible erythema would be still shorter.

The lamp has been investigated clinically and found to be satisfactory.

The Council on Physical Therapy voted to accept the Sears S-4 Sunlamp for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

EHRLICH, OFTEN TERMED THE FATHER OF CHEMOTHERAPY, INTRODUCED THE USE OF BETTER ARSENICALS IN THE TREATMENT OF SYPHILIS. HE EARLY RECOGNIZED THE SPIROCHETICIDAL EFFECT OF ARSENOXIDE BUT DISCARDED IT BECAUSE OF ITS GREAT TOXICITY. IT REMAINED, THEREFORE, FOR AMERICAN WORKERS, TATUM ET AL. OF THE UNIVERSITY OF WISCONSIN, TO SHOW THAT A SIMPLIFIED DERIVATIVE OF ARSENOXIDE, HIGHLY PURIFIED, WAS EFFECTIVE AND RELATIVELY SAFE IN THE TREATMENT OF SYPHILIS. THIS PRODUCT WAS RECOGNIZED BY THE COUNCIL AND IS SOLD UNDER THE TRADE NAME OF MAPHARSEN. RECENT STUDIES HAVE BEEN MADE OF THE USE OF THIS LATER DERIVATIVE OF ARSPHENAMINE FOR CONTINUOUS TREATMENT OF SYPHILIS OVER A PERIOD OF DAYS (THE SO-CALLED DRIP METHOD). IN VIEW OF THE INTEREST IN THIS METHOD AND THE RESULTS WHICH HAVE BEEN REPORTED THE COUNCIL DEEMED IT ADVISABLE TO MAKE A PRELIMINARY REPORT AND AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.

PAUL NICHOLAS LEECH, Secretary.

CHEMOTHERAPY OF SYPHILIS BY MASSIVE DOSE INTRAVENOUS DRIP

Great strides have been made in the treatment of syphilis, particularly in the last thirty-five years. At first, use of the mercurial preparations was elaborated. With discovery of Spirochaeta pallida, of the serologic tests for syphilis, of the specific arsenical preparations, and finally of the various bismuth salts, further great advances have been made.

Nevertheless, the fact still remained that it required a comparatively long time to get rid of the symptoms to such a point that the disease was not a menace to public health. This of course entirely ignored the effects of the disease on the patient. They were even slower to eradicate.

Various attempts have been made to find new specific remedies, and physical therapeutic agents using heat have been tried—none of them answering the problem.

It occurred to no one that perhaps by employing agents already at hand in a new form of attack it might be possible to exert greater effect on the disease.

It has remained for Chargin, Hyman, Leifer and Rice at the Mount Sinai Hospital perhaps to find such a loophole, utilizing intravenous drip therapy.

Hyman and his collaborators[1] have shown that when active or inert chemicals, drugs and biologic fluids are injected intravenously in a rapid manner they may give rise to alarming symptoms and may at times even be fatal—so-called speed shock. The animals studied showed rapid fall of blood pressure, sometimes fatal, with dyspnea, and noncoagulation of the drawn blood. These investigators found that even when simple saline solutions were employed, if there was fatality, necropsy showed multiple punctate hemorrhages of the viscera and atelectasis or emphysema of the lungs with thrombi of the veins. Experimentally if they regulated the rate of flow of the preparation by means of intravenous drip so that not more than 2 or 3 cc. a minute was injected, even toxic substances such as histamine could be introduced without difficulty.

Experiments were tried in man with the intravenous drip for physiologic solution of sodium chloride, dextrose and citrated blood, and it was thought by the authors that it might even be possible to employ potent agents in greater doses than have been employed in the past without severe reactions or damage to the host. Chargin[2] felt that the method might be applied to the administration of larger doses of arsenicals than are ordinarily employed in the treatment of early syphilis, and in 1933 Chargin, Leifer and Hyman[3] treated twenty-five persons who had early syphilis by means of the intravenous drip given in the form of solutions of 4 Gm. of neoarsphenamine over a course of five days. Five of these patients were not followed beyond the fifth month of the first year. The remaining twenty patients all showed complete serologic reversals, though five were not followed a sufficient time for satisfactory observation. Fifteen were examined on or about the fifth year. Eleven of these had repeatedly negative Wassermann reactions. Two of the fifteen had become reinfected with syphilis, one of these instances being indubitable and the other highly presumptive. It was felt that the results had been so promising that a further study should be made, and eighty-six men were used, the average dose of neoarsphenamine being slightly in excess of 4.1 Gm. and the duration of treatment slightly less than five days.

Toxic Effects

	Neoarsphenamine	Mapharsen
Total treatment courses	111	283
1. Primary fevers	69 (62%)	115 (41%)
2. Secondary fevers	71 (64%)	35 (12%)
3. Toxicodermas	50 (45%)	32 (11%)
4. Dermatitis exfoliativa	1* (0.9%)	0
5. Blood dyscrasias	0	0
6. Renal damage	0	0
7. Jaundice	4 (3.6%)	2 (0.7%)
8. Peripheral neuritis	39 (35%)	5 (mild) (1.7%)
9. Cerebral symptoms (total)	2 (1.8%)	3 (1.06%)
a. Hemorrhagic encephalitis	1 (0.9%)	1 (0.35%)
b. Single convulsion	1 (0.9%)	1 (0.35%)
c. Disorientation	0	1 (0.35%)
10. Fatality	1 (0.9%)	0

* Received sulfanilamide for complicating gonorrhea.

The technic employed was similar to that first used: First an intravenous drip of 100 cc. of a 5 per cent dextrose solution; at the end of an hour a solution of 0.1 Gm. of neoarsphenamine dissolved in 50 cc. of 5 per cent dextrose solution was used; this in turn was followed by another hour of plain dextrose solution 5 per cent, and these alternate doses were employed until the total dose had been administered for the day, so that in a period of fifteen hours the patient would have received 1,500 cc. of 5 per cent dextrose solution and 1 Gm. of neoarsphenamine.

Toxicology.—Primary Herxheimer fever was noted in 57 per cent of the patients. The average height was 102, and the highest temperature recorded was 105 F. The longest duration of febrile reaction was four days. A secondary fever appearing toward the latter part of the therapy was noted in 63 per cent of the patients.

Toxicodermas.—Scarlatiniform, morbilliform or erythema multiforme-like toxicodermas occurred in forty patients. An additional four patients developed toxicodermas in the follow-up. One patient developed a desquamation of the skin. A true dermatitis exfoliativa occurred once and was followed by complete recovery.

Peripheral neuritis occurred in 38 per cent of the patients and lasted as long as from four to six months. There seemed to be no relation between arsenic excretion or retention and the neuritis. There were no symptoms of damage to the kidneys. Four patients developed mild jaundice. Seven patients had an icterus index that exceeded 10. Five had a later secondary icterus index of 15 or more. A hemorrhagic tendency developed five weeks after the treatment in one of the early patients, and it was found that he had a thrombocytopenia, which was cured by splenectomy. Two patients exhibited cerebral symptoms suggesting a hemorrhagic encephalitis, and one of them died. It was noteworthy that nitritoid crises, various types of atrophy and degeneration of the liver, aplastic anemia and pulmonary embolizations were absent as toxicologic phenomena.

Arsenic Excretion Studies.—Analyses of the total urine and feces in twelve unselected cases showed that 20 per cent was excreted in the urine and 32 per cent from the feces during the course of therapy.

Clinical Results.—The patients showed rapid healing of the primary and secondary lesions. Darkfield studies became negative invariably in twenty-four hours. All of the patients showed good appetites and many showed gain in weight.

Effect on Serum Reaction.—These patients were checked very carefully from the standpoint of serologic reactions, and sixty-seven, 86 per cent, who were adequately followed showed complete seroreversal. Comparison of the first series with the series reported in this paper showed that the nitritoid crisis was not observed in any case. Polyneuritis was present in 32 per cent of the first and 38 per cent of the second series. Administration of vitamin B to the patients did not lessen this symptom, nor did vitamin C protect any of the patients in the second series from secondary fever.

The clinical results were quite parallel in the two series. Serologic reversal was obtained in approximately 90 per cent of both groups. There were five acknowledged failures. In the first group one patient with inadequate therapy, 2.9 Gm., had persistent seropositivity at his last visit at four months. In the second group two clinical relapses and two serologic relapses were reported.

Because of the importance of the entire problem and of the results obtained, it was thought best to gain the help and advice of public health authorities, of several foundations, and of clinicians in other institutions and in other capacities, and a Committee on Massive Drip Intravenous Therapy was formed.[4]

The committee has since made available an outline of massive dose chemotherapy of early syphilis by the intravenous drip method. Because of the toxic symptoms noted after the use of neoarsphenamine, it was decided to employ mapharsen. At first this was used in small doses, but because of the frequency of relapses and the lack of toxic symptoms the dose was gradually increased to 1.2 Gm. of mapharsen in a course of five

1. Hirshfeld, Samuel; Hyman, H. T., and Wagner, J. J.: Influence of Velocity on Response to Intravenous Injections, Arch. Int. Med. **47**: 259 (Feb.) 1931. Hyman, H. T., and Hirshfeld, Samuel: Therapeutics of Intravenous Drip, J. A. M. A. **100**: 305 (Feb. 4) 1933; Studies of Velocity and Response to Intravenous Injections: Technic of Intravenous Drip in Clinical Practice, ibid. **96**: 1221 (April 11) 1931. Hyman, H. T., and Touroff, A. S. W.: Therapeutics of Intravenous Drip: Further Observations, ibid. **104**: 446 (Feb. 9) 1935.

2. Chargin, Louis; Leifer, William, and Hyman, H. T.: Studies of Velocity and Response to Intravenous Injections: Application of Intravenous Drip Method to Chemotherapy as Illustrated by Massive Doses of Arsphenamine in Treatment of Early Syphilis, J. A. M. A. **104**: 878 (March 16) 1935.

3. Hyman, H. T.; Chargin, Louis, and Leifer, William: Massive Dose Arsenotherapy of Syphilis by Intravenous Drip Method: 5 Year Observations, Am. J. M. Sc. **197**: 480 (April) 1939.

4. Dr. Charles C. Lieb, chairman, and Drs. George Baehr, Louis Chargin, Walter Clarke, Eugene Du Bois, Harold Thomas Hyman, William Leifer, John F. Mahoney, Walter W. Palmer, Theodore Rosenthal, Evan Thomas, Bruce Webster and John L. Rice, commissioner of health, New York City.

days, i. e. 0.24 Gm. daily, and, instead of alternating an hour's use of 5 per cent dextrose solution with an hour's treatment of the mapharsen solution, 10 mg. of mapharsen is dissolved in 100 cc. of 5 per cent dextrose solution and administered simultaneously. The usual procedure is to prepare 600 cc. of such solution, containing 60 mg. of mapharsen, enough for three hours of treatment. When the apparatus containing 2,000 cc. of 5 per cent dextrose is used, a total daily dose of 0.24 Gm. of mapharsen is prepared the first thing in the morning and the solution is administered over a ten to twelve hour period. This simplifies the technic to a great extent. The hourly dose consists of 0.02 Gm. in 200 cc. of 5 per cent dextrose solution.

Variants in the usual procedure: A. There is a primary fever on the first day and therapy is stopped if the temperature reaches 101.4 F. or more. This usually happens by the sixth to the eighth hour. This insufficient dose is compensated for in the following manner: First day 0.12 Gm. of mapharsen is administered; on the second, third and fourth days 0.28 Gm. of mapharsen; on the fifth day 0.24 Gm. of mapharsen.

B. When clinical jaundice appears in the course of the treatment the procedure is interrupted. This has been seen but once in all of the cases.

Insufficient time has elapsed since the use of mapharsen to justify a final estimate of its effects as compared to those of neoarsphenamine. The toxic effects in the neoarsphenamine and mapharsen series are given in the accompanying table.

It is to be noted that there have been only five cases of peripheral neuritis (and mild) with the mapharsen (1.7 per cent), as against thirty-nine (35 per cent) with the neoarsphenamine. Primary fevers are lower with mapharsen than with neoarsphenamine; secondary fevers usually appear the evening of the last day of therapy and generally return to normal in a matter of a day or so. There were only one fifth as many of the latter with marpharsen as with neoarsphenamine. Toxicodermas in the form of a morbilliform or urticarial eruption were again only a fourth as many with mapharsen as with neoarsphenamine. While there were no cases of death from hemorrhagic encephalitis with mapharsen, nevertheless one of the patients developed convulsions two days after termination of therapy and lapsed into a stupor, in which he remained for forty-eight hours. The other two cases of cerebral symptoms were mild, one with a single convulsion and prompt complete recovery, the other showing merely a state of mental confusion. This type of reaction, however, which is one of the most dreaded of the arsenical complications, is apparently seen with mapharsen as well as with neoarsphenamine. Fortunately there was no fatality with mapharsen.

It may not be amiss to mention some later work along the same line investigated by Tzanck and his collaborators.[5] Working on the idea of Pollitzer's three daily maximal doses of an arsenical, he has devised the scheme of utilizing these doses in far larger amounts but by the same intravenous drip method which has been discussed. The claim is made that this work is entirely independent.

These investigators have treated 157 patients with neoarsphenamine by a drip method, 0.01 Gm. per minute, 1.5 Gm. a day for three days. They report that the lesions disappear rapidly; that mucous patches disappeared in two or three days; that the spirochetes could not be found after one day. The serologic reactions are reported to be almost always negative in less than two months, even in two weeks in some cases.

The technic consisted in the use of 0.01 Gm. of neoarsphenamine per cubic centimeter of physiologic solution of sodium chloride, one drop given every three seconds. A light rise of temperature was observed early in therapy. No nitritoid reactions were observed. Patients were then given two months of bismuth therapy and another three days of arsenical treatment as described. No details are given as to follow-up and study of the patients, and at least as far as publications are concerned this work does not show the care and detail used by the Mount Sinai group.

5. Tzanck, A.: Traitement arsenical massif de la syphilis (par instillation goutte à goutte). Son intérêt prophylactique, Bull. Acad. de méd., Paris **119**: 257 (March 1) 1938. Tzanck, A.; Dupernat, R., and Lewi, S.: Le traitement novarsenical massif par instillation intraveineuse goutte à goutte, Bull. et mém. Soc. méd. d. hôp. de Paris **54**: 268 (Feb. 21) 1938.

COMMENT

The work carried on by Tzanck and his co-workers in principle at least resembles the investigations of Chargin, Hyman, Leifer and Rice. Both aim at Ehrlich's idea of "therapia magna sterilisans." Nevertheless, the American workers prefer that their project be considered by itself. It is true that they also have priority. Moreover, their cases have been far more carefully studied preliminary to as well as throughout the investigation, and follow-up on their cases has been of the best possible. Thus the early studies of Hyman and his collaborators on influence of velocity in intravenous injection were carried on from 1931 to 1935, and as early as 1933 Chargin and his co-workers utilized these principles in the use of arsphenamine in massive doses for the treatment of syphilis. The work of Tzanck and his co-workers first appeared in 1938 and, while it was claimed to be entirely independent, nevertheless it utilized the principles of the intravenous drip.

The principle of this new advance in syphilotherapy is based on the ability through continuous drip therapy to utilize doses of arsenicals far larger than can ordinarily be safely administered to human beings. The results with the first twenty-five cases treated in 1933 were promising, so promising that a larger group of patients, eighty-six, were treated with neoarsphenamine. Arsphenamine was not found to be practicable because of irritation of the vein walls. Response to therapy was gratifying, lesions healed rapidly, spirochetes disappeared in less than twenty-nine hours. Of the patients adequately followed, 86 per cent showed complete seroreversal. There were five acknowledged failures in the two groups. From the standpoint of reactions a peripheral neuritis, lasting from four to six months, was noted in about one third of the cases. Moreover, 2 per cent of the patients had cerebral symptoms suggesting hemorrhagic encephalitis, and one of them died. Nitritoid crises, severe liver damage and aplastic anemia were notable by their absence. Nevetheless the frequency of toxic symptoms was so high that the group, in consultation with the larger group already mentioned, thought it best to utilize another arsenical, mapharsen. This arsenical has been used in 283 further cases. In the earlier ones the dosage was too small, resulting in a certain number of relapses. The dose now being employed, 0.24 Gm. of mapharsen a day for five days, is giving a satisfactory clinical result, although the time elapsed is too short to predict what the final five year results will show. There has been a notable drop in toxic effects as compared to those seen with neoarsphenamine. Yet one of the dreaded complications, hemorrhagic encephalitis, was still noted in three of 283 cases. Fortunately, only one of these was severe. No fatalities resulted from the use of mapharsen.

The public health aspects of this new departure in syphilis therapy are tremendous in their possibilities of rapid sterilization of early contagious syphilis. On the other hand, results in syphilis therapy cannot be determined over night, and a system that still gives evidence of possible hemorrhagic encephalitis in one of apparently every hundred cases treated is by no means a foolproof procedure.

In the opinion of the Council on Pharmacy and Chemistry the work of Chargin, Hyman, Rice and Leifer with continuous intravenous drip massive doses of arsenicals in the treatment of early syphilis offers great possibilities. In view of the frequency of toxic reactions, some of them grave in type, the Council believes a conservative attitude of the medical profession to be advisable. Such a form of syphilis therapy is still in the experimental stage and should be confined to large university and public health clinics or suitable hospitals organized to carry on this project on a recognized experimental plane. It may well be that animal experimentation may also do much to assist in answering the question. In the meantime the entire medical profession will follow with great interest the further evolution of the situation.

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SATURDAY, SEPTEMBER 7, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

INFLUENCE OF A PUBLIC HEALTH PROGRAM ON A RURAL COMMUNITY

Fifteen years ago the Commonwealth Fund, together with local and state government agencies, established a demonstration of rural public health work in Rutherford County, Tenn. At about the same time other health demonstrations were begun in other areas. Many of these demonstrations have lapsed. Some of the communities in which they function are not noted for the present quality or completeness of their public health services. Not so with Rutherford County. The work there has been continuous though unspectacular. It has been supported by local funds, which at the peak in 1929 accounted for approximately 85 cents out of a total per capita cost of $1.20; in 1933, the lowest point since the peak, such funds accounted for approximately 55 cents out of an annual expenditure of 90 cents per capita. The remainder has come from state funds and other contributions, largely from the Commonwealth Fund.

A booklet[1] now published by the Commonwealth Fund reviews fifteen years of public health work in Rutherford County. Syphilis has increased 100 per cent in cases reported in the five year period 1934-1938 as compared with the period 1924-1928; the increase in gonorrhea reported in the same length of time has been almost 700 per cent. The syphilis clinics are crowded. Of the persons under treatment 73.6 per cent have had at least twenty treatments of arsenic and twenty of a heavy metal in the last year. Although a considerable number of lapses in treatment occur, the health department nursing staff succeeds in returning a high percentage for further treatment.

One of the paradoxical developments which indicate the necessity for caution in evaluating the effect of public health measures is that in Rutherford County, with a preschool population of which 65 per cent has been immunized against diphtheria, the disease has declined less rapidly than in four adjoining unorganized counties[2] in the period 1927-1938. In general, however, a comparison of Rutherford County with these four adjoining counties and with the state of Tennessee is favorable. For example, the death rate in the five year period 1934-1938 for typhoid was 1.8 for Rutherford County, 16.0 for the adjoining counties and 5.5 for the state. Other rates were as follows:

	Rutherford County	Unorganized Counties	State of Tennessee
Measles	3.7	6.1	5.4
Influenza and pneumonia	119.6	161.6	139.9
Diarrhea and enteritis under 2 years	14.2	20.8	21.1
Stillbirths	33.5	43.9	38.6
Infant deaths	43.6	61.2	64.4
Maternal deaths	4.4	6.3	6.1

For scarlet fever the situation is reversed, with a death rate of 2.5 in Rutherford County as compared with 1.0 for adjoining counties and 1.1 for the state. The tuberculosis death rate of 87.6 is practically identical with that for the state, whereas in the adjoining counties the corresponding rate is 100.3.

Among the significant features of the Rutherford County program is its contribution to the training of public health personnel. It has been used as a public health laboratory, having trained in its last ten years a total of 518 undergraduate medical students, 101 practicing physicians and eighty-three physicians in public health work. At the same time it has trained in public health 137 undergraduate nurses and 112 graduate nurses. Three sanitary inspectors have been given postgraduate instruction.

This work shows what can be done in a more or less typical Southern rural county by enlisting available local and state facilities plus outside help. The outside aid has been given with wisdom and discretion, as indicated by the high percentage of reliance on local

1. Walker, W. F., and Randolph, Carolina R.: Influence of a Public Health Program on a Rural Community, New York, Commonwealth Fund, 1940.

2. Bedford, Cannon, Coffee and Marshall.

funds. Supplementing the outside financial aid, of course, has been the technical advice available from the expert consultants of the Commonwealth Fund and those whom they have called to their assistance. The report reflects throughout a state of excellent cooperation between medical facilities in the community and the public health service. The Rutherford County demonstration has continued for fifteen years and is no longer in the demonstration phase but is an integral part of the community life; it is periodically evaluated by competent and objective experts; no excessively optimistic claims are made for it. This project has, moreover, made a significant contribution to the solution of one of the most important problems in public health today: the training of specialized personnel.

ALLOTMENT OF FEDERAL FUNDS FOR VENEREAL DISEASE CONTROL

The Surgeon General of the United States Public Health Service, with the approval of the Federal Security Administrator, has recently issued regulations under which federal funds for carrying out the Venereal Disease Control Act are to be distributed for the fiscal year 1941.[1] Federal grants-in-aid totaling $5,672,388, or 88.8 per cent of the $6,200,000 appropriated,[2] will be allotted, compared to $4,379,250 which was allotted for 1940.[3] Allotments amounting to 26.7 per cent of the money available will be made to the states in the ratio in which the population of each state bears to the population of the United States as shown by the Census Bureau 1937 midyear population estimates. Allotments amounting to 35.3 per cent of the available amount will be made to the states on the basis of (1) the varying composite geographic and racial prevalence rate for syphilis, (2) the varying costs of providing "equal services," (3) the need for training centers and demonstrations in selected areas and (4) the need for facilities to prevent and control venereal diseases in localities where armed forces or civilian employees engaged in national defense activities are concentrated. Allotments amounting to 26.7 per cent of the available appropriation will be made to the states on the basis of financial need, which is determined to be the ability of the state to raise revenue expressed indirectly in terms of differences in per capita income. A state, to be eligible to receive a grant-in-aid, must submit to the Surgeon General (*a*) a comprehensive statement of its existing venereal disease control organization, program and budget; (*b*) a proposed plan for improving the service of its venereal disease control unit including provision for a merit system of personnel administration, provided that the state agency may exempt, among other persons, all part time professional persons not engaged in the performance of administrative duties who are paid for any form of medical, nursing or other professional service and who meet the standards of training and experience established by the responsible state authority; (*c*) specific plans for the control of gonorrhea; (*d*) a proposed plan for extending and improving district, county and city venereal disease control services for both gonorrhea and syphilis, and (*e*) a statement indicating the ways in which the proposed expenditure of federal funds may be expected to stimulate permanent progress in the prevention and control of venereal diseases in both urban and rural areas. In its plan a state may provide for training, for a period not to exceed one year, professional and technical personnel so as to qualify them to conduct venereal disease control work effectively, provided the funds used for this purpose and the scientific personnel nominated for training are first approved by the Surgeon General. Expenditures can be made only for the purposes specified in budgets approved by the state health officer and the Surgeon General. The state health officers of states receiving grants-in-aid are required to make quarterly and annual financial reports to the Surgeon General and to submit to him certain progress reports, including a semiannual report on the status of venereal disease control activities in the state, a monthly clinic report for each clinic treating venereal diseases, a monthly state morbidity report and a monthly city morbidity report for each city with a population of 200,000 or over.

As announced in the regulations, a state or territorial plan to be acceptable must make available minimal services for the control of venereal diseases which are substantially in accord with the standards that are prescribed. Any laboratory, state or otherwise, receiving federal funds must demonstrate by a suitable method that the serologic tests performed have a satisfactory sensitivity and specificity rating and it must provide laboratory services for venereal diseases on the same basis as it does for other communicable diseases. Free diagnostic and treatment facilities for both syphilis and gonorrhea must be provided, by all health departments or clinics receiving federal funds, for (1) the diagnosis and emergency treatment of all patients who apply, (2) all patients referred by a private physician either for continued treatment or for consultative advice and opinion, and (3) all patients unable to afford private medical care, provided:

> That in communities where other adequate facilities for the diagnosis and treatment of gonorrhea or syphilis are available, funds may be reallotted in the discretion of the state health officer independently to the gonorrhea or syphilis departments of polyclinics in order to provide complete clinical service.

The ability of a patient to pay for private medical care is to be determined by the state or local health department or by welfare agencies. Antisyphilitic drugs must be distributed free on the request of any physician duly authorized by law to administer such drugs. Diagnostic and treatment services must be as freely available to infected residents of other states and counties as to people who reside in the governmental unit providing the services. The services of a properly qualified full-

1. 5 Federal Register 2391.
2. Public No. 665, 76th Congress.
3. 4 Federal Register 2163.

time venereal disease control officer must be provided in each state and in each municipality if the population of either exceeds 500,000 on the basis of the 1930 census. In reallotting funds for local venereal disease control services the state health officer is required to give due consideration to the relatively higher prevalence of syphilis and gonorrhea in urban areas.

In general these regulations differ but little from those promulgated for venereal disease control for the fiscal year 1940.[3] The new regulations, however, allot to the several states and the territories for the fiscal year 1941 federal grants-in-aid exceeding by over $1,290,000 those allotted for the fiscal year 1940. The only provisions in the new regulations not contained in the prior regulations which are of particular interest to the medical profession are those set forth relating to the establishment of state merit systems of personnel administration and the proviso, as quoted, qualifying the furnishing free of facilities for diagnosis and treatment to all patients unable to afford private medical care for venereal diseases.

POISON IVY DERMATITIS

Rhus poisoning, the active principle of which is the complex radical urushiol, ranks highest among the causes of plant dermatoses and constitutes an occupational hazard for horticulturists, farmers and those engaged in clearing land, not to mention the infection of carefree ramblers in the woods. Though many efficacious methods exist for treating the eruption after it has occurred, little has been accomplished for prophylaxis. Potassium permanganate and ferric chloride discolor and pigment the skin; desensitizing injections of ascending doses of rhus toxin seem to be impracticable, if large numbers of field workers are involved.

An alkaline vanishing cream containing a nonirritant, nonstaining oxidizing agent such as sodium perborate or potassium periodate is now recommended[1] as an effective preventive against poison ivy dermatitis. By incorporating either of these drugs in an ointment and applying it to the skin of the arms and the face before exposure, even those who are previously ascertained to be highly susceptible may be effectively protected. Preliminary tests on a limited number of volunteers with a 10 per cent sodium perborate ointment, to which a poison ivy extract of well known manufacture representing a concentration fifteen times greater than that of the toxin in the fresh leaf was applied, failed to elicit reactions. Only a slight erythema, about one fourth of an inch in diameter, manifested itself at the site of application in one member of the group who was most susceptible to the reaction. Other tests made to determine the respective participation of the alkali and the oxidizing agent in the detoxicant action on rhus poison showed that the irritant principle of poison ivy was inactivated by the oxidant.

After satisfactory performance in the laboratory, the prophylactic cream was tested by actual contact and handling of poison ivy foliage. The hands and right forearms of two of the group, including the most allergic subject, were anointed with the preparation and they were set to plucking poison ivy leaves growing around a tree. In addition, the leaves were pressed against the cream-protected areas of their forearms, brushed up and down against them and allowed to remain as long as half an hour in contact. An hour later the cream was washed off with soap and water. Reactions did not occur despite the fact that the more susceptible of the two had contracted a linear vesicular eruption on an unprotected area of his arm from accidental contact with poison ivy while undergoing the test.

The United States Public Health Service, which developed this technic, recommends that vanishing creams containing oxidizing agents such as those referred to be prepared for use at least every two weeks to avoid deterioration. They should be rubbed well into the skin of the arms and face before each exposure. Soap and water used to remove the deposit of the powdered oxidant on the skin will emulsify it and wash away whatever toxins are lodged in the pores or on the skin.

1. Schwartz Louis; Warren, L. H., and Goldman, F. H.: Protective Ointment for the Prevention of Poison Ivy Dermatitis, Pub. Health Rep. 55:1327 (July 26) 1940.

Current Comment

MEDICAL APPLICATIONS OF "ATOM SMASHING"

Radioactivity has already contributed enormously to medical progress. Now it seems rational to believe that the consequences of "atom smashing" may further affect medicine in numerous ways. As pointed out by Solomon,[1] the new radioactive elements cannot be administered to human beings just as they come from the cyclotron or from any other atom smasher but must first be purified and then synthesized into some compound which is easily taken into the body. The possibilities of use, however, are illustrated by the fact that of the ninety-two known stable elements eighty-seven may be made radioactive artificially. Furthermore, they possess half-lives which are short in comparison with that of radium. Thus the intensity of radiation of radioactive phosphorus, for example, diminishes by half in the course of fourteen days. Obviously if some substance such as radioactive phosphorus proves to be therapeutically effective in any disease, its rapid decrease in activity would make its internal administration far less dangerous than that of radium. The most encouraging results in the application of such radioactive elements have been produced in the treatment of leukemia: one patient is reported to have been kept alive by the administration of radioactive phosphorus after x-ray treatment could no longer be applied. Although such observations are far too few from which to draw conclusions, the possibilities of administering radioactive substances without the attendant dangers of radium and x-rays are encouraging. The further pursuit of such therapeutic objectives is the combined problem of scientists working in many different fields.

1. Solomon, A. K.: Why Smash Atoms? Cambridge, Mass., Harvard University Press, 1940.

FIVE DAY TREATMENT OF EARLY SYPHILIS

Elsewhere in this issue of THE JOURNAL appears a report by the Council on Pharmacy and Chemistry of the American Medical Association relative to the so-called five day treatment for early syphilis. This treatment developed from the observation by Hirshfeld, Hyman and Wanger [1] that numerous chemical compounds could be safely administered to animals and human beings in amounts far exceeding the usual toxic doses by a slow continuous intravenous drip injection of dilute solutions. This manuscript was first made available in 1931. Since 1933 a considerable number of papers have appeared dealing with this technic as applied to the treatment of early syphilis by a group of workers [2] at the Mount Sinai Hospital of New York. A number of manuscripts have been read since that date before various meetings. Obviously there are considerable advantages in any method of treatment of syphilis which can be completed in a brief period of time, so that the results, if even approximately comparable to those obtainable with systems of treatment requiring months or years, are likely to bespeak for such a method the most favorable consideration. However, there must be borne in mind as well the fact that the employment of remedies with such a technic involves a certain amount of risk and that the risk with drugs of the type of neoarsphenamine and mapharsen is far greater than that with less toxic preparations. There seems to be a chance equivalent to about one in a hundred that patients treated with this technic with either drug may develop in a more or less severe form one of the most serious of all arsenical reactions—hemorrhagic encephalitis. This risk seems to be far greater with this method of treatment than with the conventional use of divided doses. Moreover, in patients treated by this technic, peripheral neuritis was encountered in 35 per cent of patients given neoarsphenamine and in 1.7 per cent of those given mapharsen by the intravenous drip method. Fevers and toxicodermas also occurred. Obviously, many more studies will need to be made both of patients under controlled conditions in hospitals and of animals in the laboratory to establish definite criteria for the use of this new technic. The method is still in an experimental stage. Its importance cannot be gainsaid, and the possibility of great advances in the practical treatment of syphilis by this or a similar technic is so important that it is to be hoped that research will be expanded and intensified so as to yield positive conclusions at the earliest possible moment.

1. Hirshfeld, Sam; Hyman, H. T., and Wanger, Justine J.: Influence of Velocity on the Response to Intravenous Injections, Arch. Int. Med. **47**: 259 (Feb.) 1931.

2. Chargin, Louis; Leifer, William, and Hyman, H. T.: The Application of the Intravenous Drip Method to Chemotherapy as Illustrated by Massive Doses of Arsphenamine in the Treatment of Early Syphilis, J. A. M. A. **104**: 878 (March 16) 1933. Hyman, H. T.; Chargin, Louis, and Leifer, William: Massive Dose Arsenotherapy of Syphilis by the Intravenous Drip Method (Five Year Observations), Am. J. M. Sc. **197**: 480 (April) 1939. Hyman, H. T.; Chargin, Louis; Rice, J. L., and Leifer, William: Massive Dose Chemotherapy of Early Syphilis by the Intravenous Drip Method, J. A. M. A. **113**: 1208 (Sept. 23) 1939. Hyman, H. T.; Chargin, Louis, and Leifer, William: Massive Dose Arsenotherapy of Syphilis by the Intravenous Drip Method, Am. J. Syph., Gonor. & Ven. Dis. **23**: 685 (Nov.) 1939.

VITAMIN C IN STRAWBERRIES AND CABBAGES

Newer data on the vitamin C content of fresh fruits and vegetables reveal that many of these foods are even richer sources of the antiscorbutic factor than any one had supposed. The luscious strawberry and the humble cabbage now are found to rank with citrus fruits as foods which can provide in a single serving enough vitamin C to meet the daily requirement for this dietary essential. Such observations have been made possible by the perfection of chemical methods for the rapid determination of vitamin C in biologic materials. The use of chemical methods for the estimation of ascorbic acid has proceeded from the biochemical research laboratories to many other fields. Some members of the canning industries find that it is advantageous to check in a routine manner the vitamin C content of products such as canned tomato juice, long recognized as an important source of vitamin C. A recent commendable trend has been the investigation of the vitamin C content of different varieties of tomatoes, oranges and other important sources of vitamin C. Satterfield and Yarbrough [1] determined the ascorbic acid content of several varieties of strawberries produced under nearly identical conditions. They report considerable variation, but all varieties of the strawberry may be considered to be rich sources of vitamin C. They found on the average from 36 to 65 mg. of ascorbic acid to each hundred grams of fresh berries. Burrell, Brown and Ebright [2] likewise report considerable variation in the ascorbic acid content of thirty-one varieties of cabbage. The lowest average value reported was 48 mg. for each hundred grams of fresh cabbage and the highest was 181. From these studies it may be concluded that, to supply a fairly liberal daily allowance of vitamin C, equivalent to 1,000 units or 50 mg. of ascorbic acid, it would be necessary to consume only from 77 to 138 Gm. of strawberries (about 3 to 5 ounces) or from 28 to 104 Gm. of fresh cabbage (about 1 to 4 ounces). Many other foods, such as potatoes, spinach and turnips, contain large amounts of vitamin C, so that it is not surprising to note that little evidence of vitamin C deficiency has been observed among the adult population of the United States. The vitamin C requirements of the adult may be supplied by a small portion of coleslaw or by about thirty strawberries. The time may come when foods will have to be selected for their contribution of dietary essentials. It will be necessary to know not only the relative amounts of ascorbic acid in different foods but also the contribution which different varieties of each food may make and the effects of processing, storage, cooking and perhaps even environmental conditions during the growing season. Agricultural economists may well begin now to give attention to the amount of vitamin C produced in calculating the yield of certain crops to the acre.

1. Satterfield, G. Howard, and Yarbrough, Mary: Varietal Differences in Ascorbic Acid (Vitamin C) Content of Strawberries, Food Research **5**: 241 (May-June) 1940.

2. Burrell, R. C.; Brown, H. D., and Ebright, Virginia R.: Ascorbic Acid Content of Cabbage as Influenced by Variety, Season and Soil Fertility, Food Research **5**: 247 (May-June) 1940.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PHYSICAL THERAPY IN THE MILITARY SERVICE

JOHN S. COULTER, M.D.
Chicago

In considering the place of physical therapy in the army during a war it is interesting to summarize a general description of the medical service in the theater of operations, the zone of communications and the zone of the interior. This summary will show that in the present duties and relations of the medical service there is no provision for physical therapy except in the zone of communications and the zone of the interior. The general mission of the medical service is:

(*a*) The preservation of the strength of the forces in the field.

(*b*) The care and treatment of the sick and injured men so that casualties may be more promptly returned to duty.

The specific duties of the medical service are:

(*a*) The initiation of sanitary measures to insure the health of the troops.

(*b*) The care of sick and wounded men in camp, on the march, on the battlefield and after removal therefrom.

(*c*) The methodical disposition of sick and wounded so as to insure the retention with the fighting forces of effectives and to relieve it of noneffectives.

(*d*) The transportation of sick and injured.

(*e*) The establishment and operation of hospitals, dispensaries and other installation necessary for the care of sick and injured.

(*f*) The supply of material necessary for the prevention of disease among troops and for the care of the sick and injured.

(*g*) The preparation and preservation of records of sickness and injury for the immediate information of higher authority, and assistance in the adjudication of claims with justice both to the government and to the individual.

(*h*) The direction and supervision of all public health measures among the inhabitants of occupied territory.

One of the assigned duties of the Medical Department is the evacuation of the sick and wounded in all theaters of operations. The difficulties and magnitude which this task may assume should be understood by all concerned. In the operation of a large force against strong resistance, as much as one fifth of the troops may have to be evacuated from the combat zone to the communications zone in a relatively short period. This movement of noneffectives from the combat zone is properly conceived as being in the nature of a withdrawal. Its execution is a responsibility of the medical service. The evacuees are unorganized, are non-self supporting and are gathered individually from all units of the field forces. They require individual care, treatment and handling through all the stages of their withdrawal from points in the forward area to the hospitals of the communications zone.

The present Regular Army division, sometimes called the Streamline and also the Triangular Division, has a medical battalion instead of a medical regiment. The medical battalion has in general a similar organization to that of a regiment. It requires less personnel, since the Regular Army division now has a strength of approximately 12,500 instead of the former 20,000.

In battle the medical regiment completes the division medical service by evacuating battalion and regimental aid stations to collecting stations (and when necessary clearing the field of wounded) by its collecting battalion. The ambulance battalion transports the sick and wounded from the collecting stations, or from points farther to the front, to the clearing station. The hospital battalion establishes and operates the clearing station, sorting, treating and otherwise preparing the patients for return to their units or for evacuation out of the division area.

Ordinarily there are assigned to one field army, in addition to other units, eight surgical hospitals, ten evacuation hospitals and one convalescent hospital.

SURGICAL, EVACUATION AND CONVALESCENT HOSPITALS

A surgical hospital is designed for the initial care of the so-called nontransportable wounded; that is, those wounded whose condition is so serious as not to permit of their immediate removal from a clearing station to an evacuation hospital.

The evacuation hospital has a normal capacity of 750 beds and receives its patients from the clearing stations and surgical hospitals established in the combat zone. Evacuation hospitals are primarily for use during battle, but they may also be established to receive sick and injured from concentration or rest centers and from large marching columns when station hospitals or general hospitals are not available for this purpose. When battle is imminent, evacuation hospitals in sufficient number to meet expected needs (usually about one for each front line division) are located and opened.

The convalescent hospital has a capacity of 3,000 beds and is designed for slightly ill and convalescent patients. It plays an important role in the conservation of the troop strength of the combat zone.

The surgical, evacuation and convalescent hospitals are all in the theater of operations. One of the most important duties of the medical department is the evacuation of the sick and wounded in all theaters of operations. The medical facilities and services in the theater of operations are such that physical therapy cannot be started in the hospitals of this zone of operations.

THE GENERAL HOSPITAL

In the communications zone the most important hospital unit is the general hospital. In a communications zone with six field armies in the theater of oper-

ations there would be authorized 300 general hospitals for the communications zone. The number of general hospitals allotted to the communications zone would depend on the location of the communications zone in relation to the zone of the interior, the extent of the zone and the number of troops involved. Under certain conditions there may be no need for general hospitals in the communications zone, while under other conditions, such as with an oversea expeditionary force, a large number may be required.

The general hospital is a fixed unit of 1,000 beds capacity, designed for the treatment of all cases arising within the theater of operations and located a sufficient distance from the combat zone so that military reverses will not disturb their operation. Its equipment is adequate for the care of all cases of whatever severity. Although designed for the definitive treatment of cases, it will be necessary in a prolonged campaign to evacuate patients from these general hospitals to general hospitals in the zone of the interior, especially those who are not likely to be fit for service for a considerable time or who will be incapacitated permanently for further military duty.

General hospitals should be located at points which afford good rail or water connection with regulating stations and with the zone of the interior. The presence of suitable buildings and utilities is most advantageous, but additional construction will usually be required. In planning construction, consideration should be given to the availability of near-by landing fields for airplane ambulances.

General hospitals, when conditions permit, are organized into groups of from three to ten. This group is called a hospital center. Each hospital center contains a convalescent camp, which normally will have a bed capacity equivalent to 20 per cent of that of the center. Patients who no longer require careful hospital treatment but who are not yet fit for duty will be transferred to this camp, where they are prepared for duty by a system of graduated exercises.

PHYSICAL THERAPY

As the equipment of a general hospital should be adequate for the care of all cases of whatever nature or severity, it is here that physical therapy should be started in the care of many fractures, dislocations, wounds and amputations. In individuals suffering from trauma, physical therapy is most effective if started early in the general hospitals of the zone of communications and continued in the general hospitals of the zone of the interior. In the First World War physical therapy was started in the general hospitals and hospital centers of the army of the United States in France and was most effective in reducing the length of temporary disability and the amount of permanent disability.

The Surgeon General of the Army recently stated that it would be the policy of the Medical Department of the Army in the next war to discharge all wounded men requiring prolonged hospitalization to the Veterans' Administration for treatment in its hospitals. This would mean that the care of cases requiring long hospitalization by the Veterans' Bureau would lessen the number of army general hospitals in the zone of the interior. At the same time this would not lessen the number of wounded in the country which require physical therapy.

In any event an estimate of 300 general hospitals of 1,000 beds each for six field armies in a war of such severity as is occurring in Europe would not seem to be excessive. Proportionately, in comparison with civil hospitals with the same number of beds an army general hospital physical therapy department will need a medical director and at least six physical therapy technicians.

The Committee on Medical Preparedness of the American Medical Association recently sent to each physician in the United States a questionnaire about service in the Army, Navy or Public Health Service during an emergency. The questions about special medical societies and specialists follows the listing in the American Medical Directory. Therefore under question 68: "Are you a member of any special medical societies?" physical therapy is not listed but there is a place where physicians specializing in physical therapy can insert "Society of Physical Therapy Physicians."

Under questions 60 to 63 physical therapy is not listed, but it can be added under 60:6, and question 75 and 76 "Service you consider yourself best qualified to perform" can be answered by those physicians specializing in the subject of physical therapy. The committee is listing physical therapy physicians as a group.

It is not surprising that physical therapy is not listed as a specialty. In 1938 a group of physicians interested in physical therapy organized a special society for physicians specializing in physical therapy, The Society of Physical Therapy Physicians. The requirements for membership in this society are that members "shall have been engaged in the practice of physical therapy for at least five years" and "shall have given evidence of satisfactory scientific attainments."

In 1940 this society has a membership of thirty-eight and a waiting list of ten. Therefore the American Medical Association is justified in not listing physical therapy as a specialty. There are other subjects not listed, such as allergy and cardiology.

For these and other reasons it should be clear that there is a shortage of at least 250 physicians qualified to take charge of physical therapy departments in a general hospital of 1,000 beds.

The Northwestern University Medical School for the last ten years has been offering to qualified graduate physicians a month's course in physical therapy. It is felt that this course serves as a substantial foundation for the intelligent application of physical therapy. The instruction consists of lectures on the physical and therapeutic principles of the physical agents and their physiologic effects, the observation of patients, the preparation of physical therapeutic prescriptions, the demonstration of technic, the attendance at clinics and the actual treatment of patients under supervision. Such a course established at many other medical schools where there is a qualified physician in charge of the physical therapy department could give the necessary basic training to physicians to be assigned to physical therapy departments of general hospitals which are to serve the military establishment.

A physician with a year's internship and at least a year's approved residency can in this month's course secure a groundwork in physical therapy that will enable him in the event of an emergency to take charge of the physical therapy department of an army general hospital. This course has been given for the last ten years. Physicians completing this course have taken charge of the physical therapy departments of twelve medical schools in the United States. With this experience it is believed that this length of a course will serve

during an emergency. It would seem desirable that some provision be made to train medical officers in such short courses as the need arises. At least ten medical schools and the Mayo Clinic have facilities to give such courses as described.

The shortage of physical therapy technicians is even more acute. At present there are 1,029 senior registered physical therapy technicians on the roster of the American Registry for Physical Therapy Technicians. The American Physiotherapy Association has a membership of 1,017. About 75 per cent of the American Registry for Physical Therapy Technicians are included in the membership of the American Physiotherapy Association. There are therefore about 1,274 trained physical therapy technicians in the United States. These technicians are all employed in hospitals, private offices or schools for crippled children or in the state program services for crippled children, sponsored by the Crippled Childrens' Division of the Children's Bureau of the Department of Labor.

It would be a great mistake to lower the educational standards for physical therapy technicians. This need not be done if training is started at once. The minimum curriculum as given by the Council on Medical Education and Hospitals of the American Medical Association requires 1,200 hours. It is believed that the 400 hours required for clinical practice could be given in the approved school for physical therapy technicians or in a hospital physical therapy department in charge of a senior registered physical therapy technician. Therefore a course could be given at an approved school of forty hours a week for twenty weeks provided the 400 hours of clinical practice was given under the direction of a senior registered physical therapy technician. This class of technicians could start in all the approved schools by Jan. 1, 1941. The class could finish at the schools in twenty weeks if necessary and take the 400 hours of practice in the physical therapy department of an army general hospital or continue the practice hours in the school if an emergency does not exist.

In the event of a national emergency, the time element is important. Therefore it would seem necessary to formulate definite plans now to meet any essential demand for medical services either to the civilian population or to the armed forces.

122 South Michigan Avenue.

COMMITTEE TO COORDINATE MINNESOTA'S DEFENSE EFFORTS

An all-university committee appointed to cordinate the efforts of the University of Minnesota to cooperate in national defense has been appointed with Dr. Harold S. Diehl, dean of medical sciences at the university, as chairman. The defense efforts of the university at present include (1) organization of the United States General Hospital No. 26, (2) training men in the naval R. O. T. C., (3) participating in the civil aeronautics authority flight program, (4) pushing two medical school research projects, one of which is concentrated on surgery and the other on human fatigue and (5) the lending of Elvin B. Stakman, Ph.D., to a government expedition to South America to study the possibility of expanding rubber production. The University of Minnesota also is one of four universities selected to assist in studies of the impact of the preparedness and defense program on business.

Organization Section

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. PAUL C. BARTON:

September 11—Meeting of the Second District of the Medical Society of Wisconsin, Lake Geneva, Wis.

DR. W. W. BAUER:

October 5.—La Porte County Public School Teachers Meeting, La Porte, Ind.

DR. PAUL A. TESCHNER:

September 30—Chicago Tuberculosis Institute at University Clinics, Chicago.

October 3—Interprofessional Men's Institute, St. Paul.

October 4—Mississippi Valley Conference on Tuberculosis, St. Paul.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. J. Res. 286, previously passed by the Senate and the House with amendments, has been reported out of conference and the report of the conferees adopted by the Senate and the House, authorizing the President, during the period ending June 30, 1942, to order into active military service, in the Western Hemisphere and in the territories and possessions of the United States, for a period of one year, retired personnel of the Regular Army and any or all members and units of any or all reserve components of the Army. S. 4203 has been reported to the Senate with amendments, providing that in the discretion of the President retired officers, warrant officers, nurses and enlisted men of the Regular Army may be employed or assigned to active duty, with their consent in time of peace but with or without their consent in time of war. S. 4224 has been reported to the Senate with amendment, providing that in time of war or during an emergency declared by the President or by Congress the Secretary of War may, in his discretion, dispense with any part of the examination for promotion in the Regular Army of officers of the Medical, Dental and Veterinary Corps, except the physical examination. S. 4245 has been reported to the Senate without amendment, proposing to authorize the Secretary of the Navy to establish naval hospitals at the naval air stations at Jacksonville, Fla., and San Juan, Puerto Rico; the submarine base, Coco Solo, Canal Zone; the naval station, Guantanamo Bay, Cuba, and the Marine Barracks, Quantico, Va. H. R. 8613 has passed the House without amendment, providing that any person who served as a member of the Army Nurse Corps or of the Navy Nurse Corps during the World War and continuously thereafter until May 13, 1926, and who was, prior to June 20, 1930, separated from said corps by reason of physical diability incurred in line of duty, shall, on her application therefor, be entitled to be placed on the retired list of the Nurse Corps of which she was a member, her retired pay becoming effective on the date of receipt by the Secretary of War or the Secretary of the Navy, as the case may be, of such application or the date of enactment of this bill, whichever is later.

Bills Introduced.—H. R. 10382, introduced by Representative Boykin, Alabama, proposes to grant permanent total disability rating to World War veterans suffering service connected tuberculosis disability if such disease remains active after two years' hospitalization and is not expected to become arrested by further hospitalization. H. R. 10384, introduced by Representative McCormack, Massachusetts, proposes to amend the Social Security Act and the Internal Revenue Code so as to extend old age and survivor insurance benefits and unemployment benefits to, among others, employees of nonprofit religious, charitable, scientific, educational and anticruelty organizations, except ordained ministers and members of religious orders performing their duties in such orders and student nurses and interns.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Health Department Headquarters Transferred to Los Angeles.—Newspapers reported, July 17, that the headquarters of the state department of health had been transferred to Los Angeles. Alterations have been approved for the Los Angeles office to accommodate Dr. Bertram P. Brown, Los Angeles, recently appointed director of the department, and his staff, it was stated.

Medical School Center in Pediatric and Obstetric Program.—The University of California Medical School, San Francisco, will be the center of all postgraduate education in pediatrics and obstetrics in a long term educational program planned by six cooperating states: California, Nevada, Utah, Idaho, New Mexico and Arizona. According to the university *Clip Sheet*, the program will be financed by funds from the participating states, the U. S. Children's Bureau and the Rosenberg Foundation. Selected physicians from each state will attend refresher courses offered by the university. Transportation and tuition will be paid by the home states. In addition, a pediatric "circuit rider" will be appointed to travel through the western states for consultations with individual physicians, district medical societies and other interested groups on problems involving the care of young children. Dr. Amos U. Christie, associate professor of pediatrics at the university, will direct the program.

CONNECTICUT

Personal.—Dr. Benjamin G. Horning has resigned as health officer of Hartford to become associate field director of the American Public Health Association for the United States and Canada, according to the state medical journal. Dr. Horning has been health officer of Hartford for four years. He graduated at Harvard Medical School, Boston, in 1928.——Dr. Ross G. Harrison, Sterling professor of biology emeritus, Yale University School of Medicine, New Haven, received the honorary degree of doctor of science from Columbia University at the recent commencement.

Sixteenth Annual Clinical Congress.—The Connecticut State Medical Society will hold its sixteenth clinical congress in New Haven, September 17-19. The following will participate:

Dr. Elliott P. Joslin, Boston, Newer Developments in the Treatment of Diabetes.
Dr. Nicholson J. Eastman, Baltimore, Complications of Pregnancy.
Dr. Herrman L. Blumgart, Boston, Treatment of Coronary Artery Diseases.
Dr. Grover F. Powers, New Haven, Chemotherapy of Streptococcus Empyema.
Dr. Howard W. Brayton, Hartford, Use of Vitamin K in Hemorrhagic Diseases of the Newborn.
Dr. James D. Trask, New Haven, Diagnosis of Pneumococcus Types from Nasal Washings.
Dr. Eugen Kahn, New Haven, Contraindications to Marriage from the Psychiatric Viewpoint.
Dr. James Flexner, New York, What We Can Learn from Gastroscopy.
Dr. Wilder G. Penfield, Montreal, The Epilepsies.
Dr. Martin Henry Dawson, New York, Treatment of Chronic Arthritis with Special Reference to the Use of Gold Salt.
Dr. Alvan L. Barach, New York, Gas Inhalation Therapy.
Dr. Frank R. Ober, Boston, Significance of Low Back Pain.
Dr. Clarence D. Selby, Detroit, An Approach to the Problems of Adult Life Through Industry.

DELAWARE

State Medical Meeting September 9-11.—The Medical Society of Delaware will hold its one hundred and fifty-first annual session at the Henlopen Hotel, Rehoboth Beach, September 9-11, under the presidency of Dr. Bruce Barnes, Seaford. Included among the speakers are:

Dr. Emil Novak, Baltimore, Some Endocrine Aspects of Gynecology.
Dr. James E. Marvil, Laurel, Otitis Media.
Dr. John A. Kolmer, Philadelphia, The Present Status of Vaccination Against Disease.
Dr. George C. Griffith, Philadelphia, The Significance of Precordial Pain.
Dr. Ernest L. Stebbins, Albany, N. Y., Streptococcic Infections.
Dr. Edward Weiss, Philadelphia, Renal Aspects of Hypertension.
Dr. Carl H. Davis, Wilmington, Complicated Labor.
Dr. Joseph B. Wolffe, Philadelphia, Atheromatous Cardiovascular Disease.

GEORGIA

Personal.—Dr. Harold W. Long, Milledgeville, has been appointed director of the crippled children's division of the state department of public welfare. He is a graduate of the University of Georgia School of Medicine, Augusta, class of 1936.

Anatomist Accepts Fellowship at North Carolina.—Dr. Charles W. Harwell, since 1921 a member of the staff of Emory University School of Medicine and since 1923 assistant professor of micro-anatomy and neuro-anatomy, has resigned to accept a fellowship in public health at the University of North Carolina. Dr. Harwell graduated at Emory in 1921.

District Meeting.—The First District Medical Society was addressed in Savannah, July 17, among others, by:

Dr. Patrick H. Smith, Savannah, Regional Anesthesia.
Dr. Louis Fielding Lanier, Sylvania, Coronary Thrombosis with Diabetes.
Dr. Elton S. Osborne, Savannah, Psychoanalysis and Medical Psychology.
Dr. Lee Howard, Savannah, The Practical Importance of Certain Drug Blood Levels.
Dr. Henry T. Compton, Savannah, The Septic Hip.

Dr. Job C. Patterson, Cuthbert, president of the state medical association, also addressed the meeting.

IDAHO

Bubonic Plague.—*Public Health Reports* announces the diagnosis of bubonic plague in a boy aged 13 years at Emmett, Gem County. The diagnosis was made by Surg. Le Grand B. Byington of the Public Health Service Plague Suppressive Measures Laboratory in San Francisco.

Society News.—The state medical association sponsored a lecture tour which included a dinner meeting with the Pocatello Medical Society, July 13; South Side Medical Society in Twin Falls, July 14, and an evening meeting with the Southwestern Medical Society at Boise, July 15. The speakers were Drs. Constantine F. Kemper, associate professor of medicine, University of Colorado School of Medicine, Denver, whose subject was "Newer Procedures in Management of Ductless Gland Diseases," and Kenneth D. A. Allen, Denver, "Carcinoma of the Cervix."

ILLINOIS

Physicians Honored.—A dinner was held in Mason City recently, honoring Dr. Chauncey W. Cargill on his completion of fifty years in the practice of medicine. The dinner was given under the auspices of the Mason City Rotary Club and the Mason County Medical Society. A medal was presented to Dr. Cargill by the Illinois State Medical Society. A similar honor marked the fiftieth anniversary in medical practice of Dr. Jasper M. Adams. Dr. Adams has practiced thirty-seven years in Canton.

Chicago

Personal.—Dr. Gustavus M. Blech recently received the military surgeon's medal from the Mexican Ministry of National Defense in recognition of his publications on war surgery and medicomilitary problems.

Memorial to Dr. Fantus.—Plans are under way to place a plaque in the new outpatient clinic building at Cook County Hospital in honor of the late Dr. Bernard Fantus, for whom the clinic building was named. Those who wish to contribute to this memorial should send their checks to the Bernard Fantus Memorial Fund, care of Elizabeth M. Adles, department of therapeutics, Cook County Hospital, 1825 West Harrison Street. The new outpatient clinics of the hospital group were dedicated, April 19, to the memory of Dr. Fantus, director of therapeutics at the hospital and creator of the "blood bank" for quick transfusions.

KENTUCKY

State Medical Meeting at Lexington.—The annual meeting of the Kentucky State Medical Association will be held in Lexington, September 16-19, under the presidency of Dr. Austin Bell, Hopkinsville. Dr. Nathan B. Van Etten, New York, President of the American Medical Association, will deliver an address Tuesday evening, September 17, on "An American Health Program," and Dr. Arthur W. Allen, Boston, will speak on "Surgical Consideration of the Gallbladder and Bile Ducts." Wednesday evening at the annual dinner Dr. Bell will deliver his presidential address and Dr. Tinsley R. Harrison, Nashville, Tenn., will speak on "Management of Patients with Acute Myocardial Infarction." The annual oration in surgery will be delivered by Dr. Allen E. Grimes, Lexington,

on "Lung Abscess" and the oration in medicine by Dr. Oscar O. Miller, Louisville, on "The Evolution of Our Knowledge of Tuberculosis." Among other speakers will be:

Dr. James R. Hendon, Louisville, An Evaluation of the Present Status of Male Hormone Therapy.
Dr. Thomas J. Marshall, Paducah, Vitamins—Their Use in Children.
Dr. Fred W. Rankin, Lexington, Indication of Surgery and Choice of Operation in Peptic Ulcers.
Dr. Shelton Watkins, Louisville, Hoarseness, An Important Symptom.
Dr. Joseph Gant Gaither, Hopkinsville, The Problem of Drainage Following Operation in the Bile Passages.
Dr. Lawrence T. Minish, Frankfort, Edema—Types and Management.
Dr. David Woolfolk Barrow, Lexington, Treatment of Appendical Peritonitis.

MAINE

Memorial Clinic.—A medical and surgical clinic, formed by physicians of Gardiner and Richmond, was opened in Gardiner, July 6, and will work in cooperation with the Gardiner General Hospital with access to all of the hospital's laboratory facilities. The new clinic is named for the late Dr. Ralph D. Simons, who practiced in Gardiner for twenty-five years.

MICHIGAN

State Medical Meeting in Detroit.—The seventy-fifth annual session of the Michigan State Medical Society will be held at the Book-Cadillac Hotel, Detroit, September 25-27, under the presidency of Dr. Burton R. Corbus, Grand Rapids. The program includes sectional meetings and seven general assemblies. Among the out of state speakers will be:

Dr. Wallace M. Yater, Washington, D. C., Surgery of the Heart and the Heart in Surgery.
Dr. Hugh Hampton Young, Baltimore, Medical and Surgical Aspects of Diseases of the Prostate.
Dr. Arthur R. Elliott, Chicago, Arterial Hypertension: Forty Years in Retrospect.
Dr. Julian Deryl Hart, Durham, N. C., Self-Inflicted Injuries.
Dr. Paul A. O'Leary, Rochester, Minn., Modern Trend in the Treatment of Syphilis.
Dr. John H. Musser, New Orleans, Vitamin and Mineral Requirements in Pregnancy and the Puerperium.
Dr. Ralph M. Waters, Madison, Wis., Methods of Resuscitation.
Dr. Charles F. McKhann, Boston, Cyanosis of the New Born.
Dr. Richard N. Pierson, New York, Planned Parenthood: Its Contribution to National Preparedness.
Dr. William G. Birch, Saulte Ste. Marie, Postpartum Sterilization.
Dr. Jacob P. Greenhill, Chicago, The Three Newest Hormones in Gynecology.
Dr. Walter Ivan Lillie, Philadelphia, Retinal Changes Associated with Arterial Hypertension.
Dr. Hans Brunner, Chicago, Indications for Simple and Radical Mastoidectomy.
Dr. Joseph Stokes Jr., Philadelphia, Prophylaxis to Measles.
Dr. Nicholson J. Eastman, Baltimore, A Study of Alpha-Lobeline, Metrazol and Coramine in Experimental Anoxia.
Dr. John G. Downing, Boston, Industrial Aspects of Dermatitis and Eczema.
Dr. Thomas T. Mackie, New York, Medical and Surgical Significance of Avitaminosis.
Dr. Edward William Alton Ochsner, New Orleans, Complications of Appendicitis.
Dr. Henry C. Sweany, Chicago, The Primary Tuberculous Infection in Adults (sponsored by Michigan Tuberculosis Association).
Dr. Paul A. Neal, Washington, D. C., Responsibility of the Medical Profession in Industrial Hygiene (sponsored by Michigan Department of Health).
Dr. Samuel A. Cosgrove, Jersey City, N. J., Hospital Organization and Staff Work as Factors in Maternal Health (sponsored by W. K. Kellogg Foundation).
Dr. Helen Flanders Dunbar, New York, Psychosomatic Aspects of Illness (sponsored by McGregor Health Foundation).
Dr. Luther Emmett Holt Jr., Baltimore, Observations on Deficiencies of the Vitamin B Group (sponsored by Children's Fund of Michigan).
Dr. Ambrose L. Lockwood, Toronto, Surgical Dyspepsias.
Dr. Chevalier L. Jackson, Philadelphia, Broncho-Esophagology in Relation to General Practice.
Dr. John D. Camp, Rochester, Minn., Tumors of the Scalp and Skull and Their Significance as Revealed by Roentgenograms.
Dr. Reginald Fitz, Boston, Changing Picture of Diabetes.

Dwight Anderson, LL.B., New York, will address the county secretaries' conference Wednesday noon, September 25, on "Good Public Relations by the Individual Practitioner of Medicine." The program also includes symposiums on preoperative and postoperative treatment in surgery and on anoxia. Dr. Rufus I. Cole, Mount Kisco, N. Y., will deliver the Andrew P. Biddle Oration at a public meeting, Wednesday evening. His subject will be "Role of Medical Societies in Medical Progress." The Biddle Oration Scroll will be presented to Dr. Cole following his lecture.

The Michigan branch of the American Medical Women's Association will meet at the Women's City Club, Detroit, September 24. A dinner will be held to honor Dr. Martha L. Longstreet, Saginaw, and speakers will be Drs. Ruth Herrick, Grand Rapids, and Mary Ruth McGuire, Detroit, whose subjects will be, respectively, "When to Refer Dermatoses" and "Obstetrical Observations."

MINNESOTA

Society News.—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, gave a special lecture at the Mayo Foundation House, Rochester, July 26, on "Problems Involving Medical Preparedness."

University News.—Lemen J. Wells, Ph.D., assistant professor of anatomy, University of Missouri School of Medicine, Columbia, since 1938, has been appointed associate professor of medicine at the University of Minnesota Medical School, Minneapolis, according to *Minnesota Medicine*.

Personal.—Dr. Alfred M. Ridgway, Annandale, celebrated his fiftieth anniversary in the practice of medicine July 14. At a gathering held to honor him, the speakers included Drs. Berton J. Branton, Willmar, president-elect of the Minnesota State Medical Association; George E. Sherwood, Kimball, and Archibald H. Beard, Minneapolis.

MISSOURI

Jackson County Health Forum.—The program for the 1940-1941 Jackson County Health Forum, sponsored by the auxiliaries of all the accredited hospitals of Jackson County, will be presented in Kansas City as follows:

Dr. Warren T. Vaughan, Richmond, Va., September 18, Allergy, the Mystery Disease.
Dr. Anton J. Carlson, Chicago, October 16, The Nature of Aging and the Chimera of Rejuvenation.
Dr. Walter C. Alvarez, Rochester, Minn., November 20, What's the Matter with the Patient Who Is Tired All the Time?
Dr. Andrew C. Ivy, Chicago, December 18, The Effects of Narcotics and Alcohol on the Human Body: Facts, Not Opinion.
Ernest R. Groves, B.D., Chapel Hill, N. C., Jan. 15, 1941, Marriage and Sex Education.
Dr. Henry H. Turner, Oklahoma City, February 19, Glandular Mechanism of the Body.
Dr. Bernard L. Wyatt, Tucson, Ariz., March 19, Arthritis—the Great Responsibility and Opportunity.
Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, April 16, Your Heart and Your Blood Pressure.
Dr. William A. O'Brien, Minneapolis, May 21, Medicine Meets Middle Age Needs.

NEW YORK

Gastro-Enteritis from Custard Pastries.—Fifteen cases of gastro-enteritis in four households in Nassau County were recently traced to custard pastries, all obtained from one bakery. Staphylococcus aureus was obtained from samples of the pastries and, although the bakery personnel had had no recent illness, insanitary practices and conditions were found, according to *Health News*.

Industrial Conference.—The 1940 medical conference of the General Motors Corporation was held in Buffalo recently. Speakers included Drs. George O. Gundersen, Lansing, Mich., on "Iontophoresis in the Treatment of Fungous Infections of the Skin"; Robert A. Kehoe, Cincinnati, "Control of Occupational Exposures to Lead"; Lydia G. Giberson, New York, "Technic of Listening to Worried Employees," and Arthur G. Cranch, New York, "Health Aspects of the Oxy-Acetylene Process."

Saratoga Springs Advisory Committee.—The Saratoga Springs Authority recently entertained the statewide medical advisory committee at a meeting at the spa with papers by the medical staff. Guest speakers were Dr. Russell L. Cecil, New York, on arthritis and Edward H. L. Corwin, Ph.D., New York, on convalescence. Appointment of this committee was authorized by the law that created the Saratoga Springs Authority and forty-one officers of state, district and county medical societies have accepted appointment, it was announced. Subsequent regular meetings are to be arranged by an executive committee elected at this meeting.

New York City

Books on Military Medicine.—An exhibit of books on historical aspects of military medicine is on view at the New York Academy of Medicine. The display begins with one of the earliest records of gunshot wounds and continues chronologically up to an account of gas warfare published in 1940, according to *New York Medical Week*. Rare books in the academy's library are included. The exhibit was arranged by Dr. Thomas Archibald Malloch, the librarian, and the library staff as part of the medical profession's preparedness plan.

Annual Graduate Fortnight.—The New York Academy of Medicine will present its annual Graduate Fortnight, October 14-25. Clinics will be held each afternoon at two hospitals and evening sessions will be at the academy building. At the first general session Dr. Eli K. Marshall Jr., Baltimore, will deliver the Ludwig Kast Lecture on "Experimental Basis of Chemotherapy in the Treatment of Bacterial Infections" and Dr. Perrin H. Long, Baltimore, the Wesley M. Carpenter

Lecture on "Clinical Bacterial-Chemotherapy; Results Obtained and Dangers Encountered." Speakers at other evening sessions will include:

Dr. Emanuel Libman, General Consideration of Bacterial Infections.
Dr. Frank L. Meleney, Prevention and Treatment of Infection in Wounds, Both Operative and Accidental.
Dr. Hobart A. Reimann, Philadelphia, Pneumococcal and Virus Pneumonia.
Dr. Robert M. Lewis, New Haven, Conn., Gonococcal Infections in the Female.
Dr. Percy S. Pelouze, Philadelphia, Gonococcal Infections in the Male.
Dr. William Thalhimer, Treatment of Infections by Methods Other Than Chemotherapy.
Dr. Thomas M. Rivers, Virus Infections.
Dr. John R. Paul, New Haven, Conn., Acute Poliomyelitis.
Dr. Walter M. Simpson, Dayton, Undulant Fever.
Dr. George Blumer, New Haven, Rickettsial Diseases.
Dr. Tracy J. Putnam, Newer Conceptions of Postinfectious and Related Forms of Encephalitis.

There will also be four morning panel discussions, with chairmen and subjects as follows: Drs. Long, chemotherapy in infections; Frederic W. Bancroft, osteomyelitis and bacterial infections of joints; Thomas T. Mackie, relation of vitamins to infection, and Alexander T. Martin, infections in children.

NORTH CAROLINA

Personal.—Dr. William P. Holt, Erwin, was honored by the Harnett County Medical Society at a dinner August 5. Dr. Holt is 70 years old and has practiced medicine forty-five years. He was graduated from Jefferson Medical College of Philadelphia in 1895.

New Building for Charlotte Presbyterian Hospital.—A new building with accommodations for 160 beds and twenty-five bassinets was opened by the Presbyterian Hospital, Charlotte, with a reception to the public July 18. The new plant was built in front of the old building, formerly a college, at a cost of about $600,000. The funds were raised through large gifts from the Duke Endowment, large and small private gifts, including donations by the Presbyterian churches of the city and Mecklenburg County. The hospital was established in 1898 and has previously expanded its capacity by moving several times. The college property, which has ten acres of ground, was purchased in 1917 and remodeled to provide 100 beds and ten bassinets. The Rev. C. C. Beam is the superintendent, Dr. Oren Moore is president of the medical staff and Dr. William Marvin Scruggs, chairman of the medical advisory committee.

PENNSYLVANIA

Personal.—Dr. Ralph Emerson Buckley, Hazleton, was elected commander of the Pennsylvania department of the Military Order of the Purple Heart at the annual convention recently.——Dr. John B. Carrell, Hatboro, who recently celebrated his eighty-ninth birthday, is compiling a historical scrapbook of the Bucks County Medical Society.——Dr. Effie C. Ireland of the staff of Laurelton State Village, Laurelton, has been appointed superintendent to succeed Dr. Mary Moore Wolfe, who had been superintendent of the institution since its opening in 1919.

Philadelphia

Dr. Craighill Appointed Acting Dean.—Dr. Margaret D. Craighill, Greenwich, Conn., has been appointed acting dean of the Woman's Medical College of Pennsylvania to fill the vacancy caused by the retirement of Dr. Martha Tracy. Dr. Craighill graduated from Johns Hopkins University School of Medicine, Baltimore, in 1924 and was assistant resident in gynecology at Johns Hopkins Hospital from 1926 to 1928. Since 1928 she has been in private practice in Greenwich.

SOUTH CAROLINA

Annual Piedmont Assembly.—The annual Piedmont Postgraduate Clinical Assembly will be held at the Anderson County Hospital, Anderson, September 17-19. The program includes the following addresses:

Dr. Jack C. Norris, Atlanta, Ga., Technical and Chemical Importance of the Erythrocyte Sedimentation Rates.
Archie Black, Ph.D., Squibb Institute for Medical Research, New Brunswick, N. J., Recent Work in the Field of Vitamin Therapy.
Dr. Everett L. Bishop, Atlanta, The Melanomas.
Lieut. Col. James E. Ash, Army Medical Museum, Washington, D. C., Bone Pathology.
Dr. James J. Clark, Atlanta, X-Ray in the Treatment of Infections.
Dr. Robert A. Ross, Durham, N. C., Sex Endocrine Therapy and Pelvic Surgery.

In cooperation with the South Carolina division of the Southeastern Surgical Congress, the assembly will present a symposium on fractures by Drs. William A. Boyd, Columbia; Joseph Warren White and Charles O. Bates, Greenville; Carroll J. Scurry, Greenwood; Lowell H. Coleman, Spartanburg; Frank A. Hoshall, Charleston; Austin T. Moore, Columbia, and Edward T. Kelley, Kingstree. Dr. Le Grand Guerry, Columbia, will introduce the symposium with "A Potpourri of Surgical Impressions." At an evening dinner Dr. William L. Pressly, Due West, president of the South Carolina Medical Association, will discuss "Military Preparedness and the Physician." Dr. Edgar A. Hines, Seneca, is president of the assembly.

TENNESSEE

Surgical Meeting.—The Tennessee division of the Southeastern Surgical Congress will meet in Shelbyville, September 17, with the Bedford County Medical Society as host. Among the speakers will be Drs. Edgar G. Ballenger, Atlanta, Ga., on "Hematuria—Pyuria"; Irvin Abell, Louisville, Ky., "Problems of the Mammary Glands," and Troy P. Bagwell, Knoxville, "Management of the More Common Types of Fractures."

GENERAL

New Ruling on Case Records for Board Examinations.—The American Board of Obstetrics and Gynecology at its recent annual meeting at Atlantic City adopted a ruling that case records submitted by candidates must be of patients treated within four years prior to the date of the candidate's application. In addition, the ruling stipulated that the number of cases taken from the candidate's residency service should not be more than half (twenty-five) of the total number (fifty) of cases required. Applications for the next examination and review of case histories (Part I) for group B candidates, which will be held in various cities of the United States and Canada on Saturday, Jan. 4, 1941, must be on file in the office of the secretary not later than October 5, the board announced. For further information and application blanks, address Dr. Paul Titus, secretary, 1015 Highland Building, Pittsburgh.

Outbreak of Poliomyelitis in Indiana.—One hundred and ninety-four cases of infantile paralysis were reported in Indiana for the four weeks ended August 24, newspapers reported. Twenty deaths have been reported in the state since June 1. Most of the cases, 10 per cent of which are in adults, have been in the northern half of the state. Two cases were recorded in June, seventeen in July and for the consecutive four weeks in August, fifteen, forty-one, fifty-eight and seventy-nine. Reports from counties showed fifty-one cases and six deaths in St. Joseph, forty-one in Elkhart, seventeen in Marshall, fourteen in Marion and ten in Fayette. In St. Joseph County the opening of all schools has been postponed two weeks until September 16. Children are not permitted to attend theaters, picnics are not permitted in parks and other gatherings are being discouraged. School openings in the city of La Porte and La Porte County have been postponed from September 3 to September 9. Six high schools in the eastern division of the Northern Indiana High School Conference have ordered suspension of football practice and have canceled the first two games of the football schedule: Washington, Central, Riley and John Adams in South Bend; Central in Mishawaka, and the high school in Goshen. Every effort is being directed by the state health department and cooperating agencies toward controlling the outbreak, including educational activities for parents and practicing physicians. The state maintains hospital service for acute and convalescing cases of poliomyelitis at the Indiana University Medical Center, Indianapolis. The crippled children division of the state department of public welfare has funds available to furnish medical consultation to physicians any place in the state for their patients in the acute stages. This division also has six orthopedic nurses who are available to assist physicians in the proper splinting of paralyzed muscle groups in the acute stage of the disease. The National Foundation for Infantile Paralysis has placed its equipment and facilities at the disposal of the state department of health, including iron lungs, splints and frames.——A release from the state department of health of Iowa indicates that seventy-three cases of poliomyelitis were reported for the week ended August 24, as compared with one for the corresponding week last year.——Newspaper clippings report an increasing number of cases in northern Michigan. Between May 15 and August 22 sixty cases with nine deaths were reported from seven upper peninsula counties.

CORRECTION

Pan American Sanitary Conference.—In a news item under Latin America in THE JOURNAL, August 17, page 545, it was stated that the Pan American Conference of Directors of Health would meet in Rio de Janeiro in 1942. This should have been the Pan American Sanitary Conference.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 1, 1940.

Special Surgical Centers for War Casualties

In December last the Ministry of Health announced that arrangements had been made for establishing special centers for the treatment of faciomaxillary, head and chest injuries and orthopedic cases of the war. The medical superintendents of war hospitals were told that there should be no hesitation in transferring suitable cases to these centers, as success depended on casualties reaching centers where specialist skill and equipment were available at the earliest possible time. The types of cases to be sent to orthopedic centers were fractures, deformities of the limbs and spine, diseases and derangements of joints, including the spine, and injuries of the peripheral nerves. Now that a considerable number of casualties are being admitted to the war hospitals, the ministry has again drawn attention to the need for transferring cases to the special centers when this can be done without risk to the patient. Early transfer is enjoined in all types of cases but particularly in faciomaxillary cases and cases in which plastic surgery may be needed. If advice is required as to the line of treatment to be adopted or if there is any doubt as to the desirability of transferring the case, the assistance of the appropriate consultant adviser should be sought. There are now in England ten special surgical centers for the treatment of faciomaxillary injuries, six for the treatment of head injuries, nine for chest injuries and eighteen for orthopedic cases.

Body Armor in War

The use of body armor in war continues to be discussed. The important discussion at the Section of Surgery of the Royal Society of Medicine was reported previously. The suggestions were not confined to body armor but concerned also the strengthening of certain parts of aircraft and other machines. For this purpose compressed fiber and materials such as bakelite, which are very light yet capable of withstanding shrapnel, are suitable. Experiments were made in the last war with body armor. Breastplates were put on the market by several firms and were occasionally issued on trial. They were also sometimes found in captured German machine gun positions. The chief argument against them was their weight. It was thought that some of them might result only in the expansion of the bullet and thus increase the severity of the wound. But since then progress has been made in producing light metals of great tensile strength.

In modern war many men are killed by small missiles which enter the chest and pierce a blood vessel or the heart. Often there is no great velocity behind these missiles. There are many cases of bullets or splinters being stopped by a cigaret case or a little flask carried in the breast pocket. It should not be impracticable to provide certain troops, such as machine gun detachments, with some protection on the these lines. The shrapnel helmet, now adopted by all armies, has proved invaluable but does not protect the eyes from missiles not coming from above. For this purpose a duralumin visor has been suggested. Though the whole energies of the country are as far as possible diverted to war, nothing so far is known of the production of body armor.

The International Standards for Antitoxin and Tuberculin

The international standards for serums and bacteriologic products are held on behalf of the Health Organisation of the League of Nations by the State Serum Institute, Copenhagen, which has furnished samples to institutions and research workers in different countries. As the war has interrupted the supply, the league has requested the Medical Research Council in London to allow samples of the British standards for these products held by it to be furnished to those who have hitherto received the international standards from Copenhagen. The Medical Research Council has agreed to do this and so prevent the complete interruption of the service. The British standards are either part of the same materials as those kept at Copenhagen or have been repeatedly tested by the British and Danish institutes to ensure that the units determined in terms of the British standards are exactly equivalent to the international units. The following are the standards available: (1) Identical in material with the international standards: staphylococcus antitoxin, gas gangrene antitoxins (perfringens, Vibrion septique, oedematiens, histolyticus), antidysentery serum (Shiga), antipneumococcus serum (types I and II), old tuberculin. (2) Different in material but with identity of the unit indication confirmed twice a year at Copenhagen and London: diphtheria antitoxin, tetanus antitoxin. The British can also supply a standard solution of diphtheria antitoxin for the flocculation test. The stocks are adequate to meet all demands except for antipneumococcus serums and it is therefore requested that demands for these be restricted to essential needs. It is also requested that, in order to conserve these standards, laboratories will cooperate by establishing local standards the potency of which has been determined by comparative tests.

The Treatment of War Wounds

The Medical Research Council has appointed a committee, which includes representatives of the fighting services and the emergency service established for the treatment of war casualties under the Ministry of Health, to advise on the application of the results of research to the treatment of wounds. The committee consists mostly of eminent surgeons, some of whom hold military or naval rank attained for service in the last war: Sir Cuthbert Wallace (chairman), Mr. E. Rock Carling, Mr. C. H. S. Frankau, Prof. F. R. Fraser, Prof. G. E. Gask, Surgeon Rear Admiral G. Gordon Taylor, Col. Sir Charles Gordon-Watson, Major General H. Marrian Perry, Prof. R. S. Pilcher and Prof. J. Paterson Ross. There are two bacteriologists: Sir John Ledingham, F.R.S., and Prof. W. W. C. Topley.

The Highest Marriage Rate on Record

One result of the war is to produce the highest marriage rate on record. In 1939 it was 21.1 per thousand of population against 17.6, 17.5 and 15.8 in the preceding years backward. The connection with the war is shown by the fact that the increase took place in the second half of the year. The reason is that most of our young men are in the fighting forces and that their wives and children are entitled to allowances, including pensions in case of death.

Sir George Berry

Sir George Berry, a leading ophthalmologist, has died in his eighty-seventh year. Educated at Edinburgh, he studied ophthalmology for some years in various European hospitals. In Copenhagen he worked with his uncle, Prof. Hansen Grut, a distinguished ophthalmologist. While still comparatively young, Berry was regarded as an authority both on the European continent and in America. He produced a textbook, "Diseases of the Eye," which had a great reputation not only as an exhaustive treatise but as embodying many original observations and ideas. Two other works, "Subjective Symptoms in Eye Disease" and "Ophthalmoscopic Diagnosis," were also widely read. His remarkable knowledge of the significance of early symptoms in the early diagnosis of disease not only was valuable in diagnosis but gave great interest to his teaching of students. He served on the staff of the eye department of the Royal Infirmary,

Edinburgh, for twenty-three years. He was one of the founders of the Ophthalmological Society of the United Kingdom, of which he was president in 1909-1911. He contributed many important papers to its transactions.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 2, 1940.

Influenza in Buenos Aires

A widely prevalent infectious catarrh, generally called grip but having nothing in common with the malignant form of 1918, and which involves entire families, has been active since the beginning of July in what is the winter season of this hemisphere. Persons affected need to stay in bed for a few days. Fever as high as 103 F. is encountered, accompanied with disorders of the upper respiratory passages, less frequently with those of the gastrointestinal tract. Its virulence is attributed to the brusk climatic changes that were frequent this year. Micro-organisms such as pneumococci, Pfeiffer's bacillus and Neisseria catarrhalis, generally found on the oral and pharyngeal mucosa, are activated by severe changes of temperature. No deaths have been reported.

Bubonic Plague

The four isolated cases of plague that appeared in the northern province of Salta had no geographic relation to one another. Dr. Julio D. Outes, head of the plague control service in Salta, ascribes these isolated cases to rodents living in the woods, in which the plague bacillus was shown to be present. At the time of the occurrence of the disease there was also a considerable infestation of rats. Prophylactic inoculation against plague was demonstrated to be ineffective. General inoculation at the time of the appearance of plague is therefore useless. There is need of a new active vaccine. Professor Sordelli, director of the bacteriologic institute in Buenos Aires, has demonstrated that immunity conferred by the plague itself is permanent.

More recently new cases involving not only bubonic but also pneumonic plague have been reported from northern Argentine provinces. These no doubt are causally to be connected with the rat invasions observed there. The national health department took immediate steps to enforce the law requiring property owners and local and provincial authorities to exterminate rats and other rodents. A commission was also appointed, which has worked out extensive plans of control.

Tuberculosis

The second national conference on tuberculosis, held recently in Cali, Colombia, adopted a number of recommendations. The high infectiousness in childhood makes social prophylaxis imperative. Since, according to law, tuberculosis is considered an occupational disease, proof of infection must be submitted. It was pointed out that institutions for tuberculous persons within city limits do not constitute a danger to the community if appropriate hygienic regulations are carried out. Early diagnosis and treatment of tuberculosis as well as official protection of the public by eliminating the advertising and sale of medicines guaranteed to cure tuberculosis were demanded by the conference. Houses previously tenanted by tuberculous persons represent no source of infection if disinfection has been properly made. Prophylactic vaccination against tuberculosis as well as the training of school teachers in breathing exercises and in the protection of school children against tuberculosis was recommended.

In Lima, Peru, the first national conference on tuberculosis, held in April, called attention to the number of incurable cases and asked for an increase in hospital beds. The conference recommended the technical and scientific unification and control of all existing institutions under the proper service of the government. The organization of a national council for tuberculosis control, designed to extend social and economic aid over the whole country and to enlist the cooperation of philanthropists, was recommended. Facilities for lung surgery were asked. The conference recommended the study of compulsory insurance against tuberculosis in Peru, the establishment of university courses for special training in the field of tuberculosis and the control of quack advertising.

The Argentine League Against Tuberculosis is active. The state has permitted a lottery, which has met with popular favor. The price of a chance is 1 peso (30 cents). The proceeds will be used to equip the league's fourteen story tuberculosis institute now under construction. The sums of 500,000 pesos (about $150,000) raised by public contributions and 1,050,000 pesos (about $312,000) appropriated by the government have already been expended; the complete cost of construction and of equipment is estimated at 10,000,000 pesos (nearly $3,000,000). It will contain 1,373 beds and research facilities. The immediate plans envisage a sanatorium with 482 beds costing about 4,300,000 pesos ($1,280,000). The records of welfare stations and dispensaries indicate that eight out of every ten patients seeking consultation show progressive stages of tuberculosis. This alarming revelation has led to a change of procedure: patients are now visited in their homes and receive early treatment. Other organizations have likewise shown great interest in antituberculosis work. A cooperative organization, founded in 1924, in the department of justice and education has recently opened new consultation centers and will shortly operate a mountain sanatorium in Alta Gracia, Córdoba. This organization furnishes medicine, gives pensions to patients who must enter an institution and grants traveling expenses and financial aid to patients who must move to climatically favorable regions. Members pay a monthly fee of 50 centavos (15 cents). Members pay 20 centavos (6 cents) on the death of one of its members. The organization is now able to pay a death benefit as high as 8,000 pesos ($2,380). The results achieved by this organization against tuberculosis have led to a project for compulsory insurance of this kind for all of the 270,000 federal employees.

Personal

Prof. Angel H. Roffo was appointed incumbent of the new chair of cancerology, established at the faculty of medicine of the University of Buenos Aires.

Marriages

EDWARD JAMES MCDERMOTT BLANCHARD, New York, to Miss Mary Bowers Carter of Englewood, N. J., June 22.

KENNETH DUNHAM, St. Augustine, Fla., to Miss Mary Catherine Badgett of Richwood, W. Va., in July.

FRANCIS EDMUND SHEARER, Louisville, Ky., to Miss Hazel Broaddus of Lancaster at Atlanta, Ga., June 22.

ROLAND HARRIS VAUGHAN, Edenton, N. C., to Miss Ruth Elizabeth Miller of Wilkes-Barre, Pa., June 1.

WILLIAM CAMP MATTHEWS, Davidson, N. C., to Miss Edith Mountcastle Summers of Charlotte, June 26.

ROBINSON MARSHALL TRUIT JR. to Miss Eleanor Marie MacDonald, both of Philadelphia, June 29.

THURMOND DE WITTE BOAZ JR., Shreveport, La., to Miss Margaret Davenport of Seattle, June 18.

HAL STANDISH JOHNSON, Berwind, W. Va., to Miss Ellen Reynolds of Chesterfield County, June 5.

CHARLES JULIAN RAGAN, New Orleans, to Miss June McCann of Brookhaven, Miss., June 15.

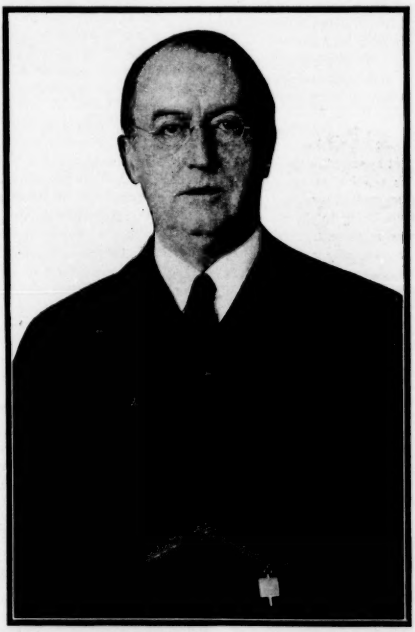
JOHN CLINTON ALLEN, North Haven, Conn., to Miss Ruth Hensel of Germantown, Pa., recently.

HAZAEL JOSEPH WILLIAMS, Brownsburg, Va., to Miss Marion Louise Pugh of Richmond, May 25.

GUS ECKHARDT, Galveston, Texas, to DR. MARY ELIZABETH FATHERREE of New York, June 26.

Deaths

William Allen Pusey ✠ President of the American Medical Association, 1924-1925, died at his home in Chicago, August 29, aged 74. Dr. Pusey had a distinguished career as a scientist, a teacher, an author and a civic and medical leader. He was born Dec. 1, 1865, in Elizabethtown, Ky., the descendant of a Kentucky pioneer family. His father was a physician and his great-grandfather on his mother's side was Dr. John T. Hodgen of St. Louis, one of the most famous surgeons of his day and also President of the American Medical Association. Following graduation from Vanderbilt University in 1885, where he received the A.B. degree, Dr. Pusey continued his studies, receiving the master's degree in 1886 and election to Phi Beta Kappa. He then attended the University of the City of New York Medical Department, receiving the M.D., degree from that institution in 1888. For the next five years he did family practice in Kentucky and after his father's death spent considerable time in postgraduate training in New York and in Europe. In 1893 he came to Chicago to specialize in diseases of the skin. He was made professor of dermatology in the University of Illinois College of Physicians and Surgeons in 1894, holding that position until 1915, at which time he became professor emeritus.



WILLIAM ALLEN PUSEY, M.D., 1865-1940

Dr. Pusey became president of the American Dermatological Association in 1910 after having been president of the Chicago Dermatological Association for three terms. He was president of the Chicago Medical Society, 1918-1919, and president of the Institute of Medicine of Chicago, 1926-1927. In the American Medical Association, he served as a member of the House of Delegates from the Section on Dermatology and Syphilology in 1910 and in 1914, and as a delegate from the state of Illinois from 1926 to 1932. He was elected treasurer of the American Medical Association at the Los Angeles session in June 1911 and served in that capacity until the St. Louis session of 1922. He was also chairman of the Section of Dermatology in 1909. In 1923 he was elected President of the American Medical Association. His memberships in scientific organizations included the Chicago Pathological Society, the Chicago Roentgenological Society, the Japanese, Czechoslovakian, Britsh, Viennese and Danish Dermatological societies, and the Dermatological Section of the Royal Society of London.

During the World War Dr. Pusey was attached to the Surgeon General's office as chairman of the committee for the control of venereal diseases.

In the scientific aspects of dermatology Dr. Pusey was a pioneer, particularly in the therapeutic use of the roentgen ray. In his book first published in 1903 he presented many new uses for the roentgen ray, including its application in leukemia and Hodgkin's disease, in which he was the first to employ it. His work as an educator in medical science is widely recognized; he was given the honorary degree LL.D. by the University of New Mexico in 1925, and he served as a member of the Commission on Medical Education from 1925 to 1932.

Notwithstanding his multitudinous scientific activities, Dr. Pusey devoted himself to civic duties and responsibilities. He was chairman of the Health Division of the Chicago Council of Social Agencies, a member of the Advisory Board of the Cook County Bureau of Public Welfare and a director of the Non-Partisan Voters' League. He was also a member of the Executive Committee of the National Research Council, a member of the executive committee of A Century of Progress Exposition in Chicago and a member of its board of trustees, and a director of the Rosenwald Museum of Science and Industry.

Dr. Pusey's literary contributions were associated with the historical aspects of dermatology and syphilology and included not only innumerable articles in periodical literature but also books on "The Roentgen Rays in Therapeutics and Diagnosis" (1903), "The Principles and Practice of Dermatology" (1907), "Syphilis as a Modern Problem" (1915), "History of Dermatology" (1932), and "History of Syphilis" (1933). As a hobby, he concerned himself particularly with colonial history related to the state of Kentucky. His work "The Wilderness Road to Kentucky," published in 1921, was recognized as a classic contribution. He was also author of "A Doctor of the 1870's and 80's," published in 1931. His contributions addressed to the public included a popular work on "The Care of the Skin and Hair" (1912) and other educational works on the venereal diseases. He had contributed to the *American Mercury*, *Good Housekeeping* and many other leading magazines.

No doubt, one of his greatest services to American medicine was the conducting of negotiations which resulted in establishment by the American Medical Association of the *Archives of Dermatology and Syphilology* in 1920. Under his editorship many a young man was introduced into proper methods of research in the literary aspects of his chosen profession and many were taught the fundamentals of good scientific literary expression. In January 1937 a special number of the *Archives of Dermatology and Syphilology* was dedicated to Dr. Pusey. The contributors included writers in every field of medical science, educators, historians and leaders in civic affairs. In recent years, even though in failing health, Dr. Pusey continued his activities for the advancement of medical science, aiding in the campaign against regimentation of medical practice exactly as he had fought previously for raising the standards of medical education.

The life of Dr. Pusey is conspicuous for his service to his specialty in medical science, to the institutions with which he was associated and to the organized medical profession. He lived a full life almost to the moment of his passing, and the influence of his career will continue for many years to come.

Percy Moreau Ashburn ✠ Colonel, U. S. Army, retired, Washington, D. C.; Jefferson Medical College of Philadelphia, 1893; entered the army as an assistant surgeon in 1898 and was promoted through the grades to rank of colonel in 1917; retired in 1931 for disability in line of duty; returned to active duty from Jan. 1, 1932, to Aug. 15, 1932; was president of the Army Board for the Study of Tropical Diseases in the Philippine Islands, 1906-1907; served with the United States Commission to the Republic of Liberia in 1909; was detailed president of the Army Board for the Study of Tropical Diseases of the Philippine Islands and Ancon, Panama, in 1913; general inspector of the Panama Canal Health Department, 1914-1915; commander of the Medical Officers Training Corps at Fort Benjamin Harrison, Indiana, 1917; served with the American Expeditionary Forces, 1918-1919; was decorated with the Legion of Honor for services in France; commandant of the Medical Field Service School from 1920 to 1923; professor of military hygiene,

United States Military Academy, from 1923 to 1927; librarian of the Army Medical Library in Washington, D. C., from 1927 to 1932, when he retired; since 1932 superintendent of the Columbia Hospital for Women; fellow of the American College of Surgeons and the American College of Physicians; author of "Elements of Military Hygiene," 1909, and "History of the Medical Department of the United States Army," 1929; at one time on the editorial staff of the *Quarterly Cumulative Index Medicus;* aged 68; died, August 20, of carcinoma of the prostate with metastases to the lungs and pelvic bones.

Harold Douglas Singer ✠ Chicago, editor-in-chief of the *Archives of Neurology and Psychiatry* since 1934, died on his ranch in New Mexico, August 28, following a heat stroke. He was 65 years old. Dr. Singer was born in London, England, Jan. 7, 1875. Following his studies in the Merchant Taylors' School, he was educated in the University of London, St. Thomas's Hospital and the Royal College of Physicians, receiving the degrees of bachelor of medicine and doctor of medicine. He served as house physician in St. Thomas's Hospital, London, 1898, and as assistant superintendent of the Clinical Laboratory, 1899. Then he became resident in the National Hospital of London, 1900-1901, and assistant resident physician in St. Thomas's Hospital from 1902 to 1904. When he arrived in the United States in 1904 he became associate professor of neurology in Creighton University School of Medicine, Omaha, from 1904 to 1906, then associate professor of psychiatry in the University of Nebraska College of Medicine, Omaha, 1906-1907. He served at the same time as assistant superintendent of the Norfolk (Neb.) State Hospital. In 1907 he came to Illinois as director of the Illinois State Psychopathic Institute, holding that position until 1920. He became state alienist in Illinois in 1917 and was at the same time special examiner for the Illinois Exemption Board, advisory consultant in neuropsychiatry to the Surgeon General of the U. S. Public Health Service and, from 1919 to 1922, advisory consultant for the U. S. Veterans Bureau. Since 1919 he had been professor of psychiatry at the University of Illinois College of Medicine.

HAROLD DOUGLAS SINGER, M.D., 1875-1940

Dr. Singer was a Fellow of the Royal Society of Medicine and the Royal College of Physicians and a member of the American Neurological Association, the American Psychiatric Association and the American Psychopathological Association. At the time of his death he was president of the American Neurological Association and president-elect of the American Psychiatric Association.

Early in his career he began contributing to various publications in his special field. He was author of the section on mental diseases in Nelson's Looseleaf System of Medicine and of the section on psychoneuroses in Tice's Looseleaf System of Medicine. He was distinguished as an educator both of the medical profession and of the public. In 1934 he became president of the American Board of Psychiatry and Neurology and was exceedingly active in the work of that organization. He served also as an expert witness in many legal cases.

For the American Medical Association he was appointed in 1930 as chairman of the Committee to Study Problems in Mental Hygiene and Hospitals and was chairman of the Section on Nervous and Mental Diseases, 1934-1935. He became a member of the editorial board of the *Archives of Neurology and Psychiatry* in 1930, succeeding Dr. Theodore Weisenburg as editor-in-chief in 1934, and he did significant work in the advancement of that publication. He had also been attending neuropsychiatrist at the Milwaukee Sanitarium since 1923 and attending neurologist at the Augustana Hospital since 1931. Dr. Singer possessed a quiet manner and pleasing personality, a scientific point of view and an integrity that never yielded to selfish influences.

Horace Madison Hicks ✠ Amsterdam, N. Y.; Chicago Homeopathic Medical College, 1886; past vice president of the Medical Society of the State of New York; past president and secretary of the Medical Society of the County of Montgomery; veteran of the Spanish-American War; secretary of the Tuberculosis and Health Association of Montgomery County; at one time health officer, and president of the school board; on the staffs of the Amsterdam City and St. Mary's hospitals; aged 77; died, July 19, of coronary occlusion.

George Taylor Stewart, Johnston, R. I.; Hahnemann Medical College of Philadelphia, 1882; chief of staff and superintendent of the Metropolitan Hospital, Welfare Island, N. Y., from May 1, 1890, to Jan. 7, 1901, and superintendent from April 1, 1906, to Dec. 31, 1907; superintendent of the Bellevue Hospital, New York, from Jan. 7, 1901, to Jan. 14, 1903; superintendent, department of health, New York City, from Jan. 14, 1903, to April 1, 1906; aged 85; died, July 25 of chronic myocarditis and arteriosclerosis.

Benoni Mowry Latham, Mansfield, Mass.; Harvard Medical School, Boston, 1900; member of the Massachusetts Medical Society; for many years chairman of the school committee; served during the World War; past president of the Bristol North District Medical Society; on the courtesy staff of the Sturdy Memorial Hospital, Attleboro; aged 67; died, July 24, in a hospital at Taunton of chronic myocarditis and arteriosclerosis.

Claude Oliver Abernethy, Raleigh, N. C.; University of North Carolina School of Medicine, 1906; member of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; on the staffs of the Rex Hospital and St. Agnes Hospital; served during the World War; aged 59; died, July 21, in a hospital at Goldsboro of a fractured skull received in an automobile accident.

Filip Carolus Forsbeck ✠ Cincinnati; Rush Medical College, Chicago, 1926; surgeon, United States Public Health Service; formerly epidemiologist, Massachusetts State Health Department, and director, bureau of epidemiology, Michigan State Health Department; aged 40; died, July 13, at the United States Marine Hospital, Baltimore, of glioblastoma.

Harvey Park Barret ✠ Charlotte, N. C.; University of Louisville (Ky.) Medical Department, 1908; member of the American Association of Pathologists and Bacteriologists, the Society of American Bacteriologists and the American Society of Clinical Pathologists; aged 55; died, July 30, of coronary occlusion.

Rose Hirschler ✠ Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1899; professor of dermatology at her alma mater; member of the American Academy of Dermatology and Syphilology; aged 65; on the staff of the Woman's Hospital, where she died, July 26, of lymphatic leukemia.

Franklin Simcoe Gillespie ✠ Swarthmore, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1923; health officer of Swarthmore; physician to Swarthmore College; aged 43; died suddenly, July 27, while boating on the Northeast River at Northeast, Md., of coronary thrombosis.

Arthur James O'Leary, New York; University of the City of New York Medical Department, 1889; past president of the Bronx County Medical Society; formerly assistant sanitary superintendent of the health department in the Bronx; aged 71; died, July 27, of pulmonary tuberculosis.

William Henry Berge, Scranton, Pa.; College of Physicians and Surgeons, Baltimore, 1893; member of the Medical Society of the State of Pennsylvania; formerly coroner of Luzerne County and chairman of the board of health; aged 71; died, July 14, of coronary thrombosis.

Edward Wyker Closson ✠ Lambertville, N. J.; University of the City of New York Medical Department, 1885; formerly postmaster, county coroner, president of the school board and bank president; aged 78; died, July 19, of interstitial nephritis and cardiovascular sclerosis.

Harry Berger, Trenton, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1914; member of the Medical Society of New Jersey; on the staff of the McKinley Hospital; aged 51; died, July 21, of injuries received in an automobile accident.

George J. Gannett, Syracuse, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1900; member of the Medical Society of the State of New York; aged 63; died, July 20, when the automobile in which he was driving was struck by a train.

Percival Bainbridge Glew, Dallas Center, Iowa; Drake University College of Medicine, Des Moines, 1913; member of

the Iowa State Medical Society; aged 50; died, July 8, in a hospital at Springfield, Ohio, of coronary occlusion and cerebral embolism.

John E. Fuller, Paris, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1888; member of the State Medical Association of Texas; aged 78; on the staff of the Sanitarium of Paris, where he died, July 20, of cerebral hemorrhage.

Archie Phelps Campbell, East Ellsworth, Wis.; University of Pennsylvania School of Medicine, Philadelphia, 1924; member of the State Medical Society of Wisconsin; on the staff of the City Hospital, River Falls; aged 46; died, July 15, of heart disease.

Thomas Irving Packard, Lanark, Ill.; Rush Medical College, Chicago, 1895; member of the Illinois State Medical Society; for many years president of the school board; aged 75; died, July 4, of cerebral embolism, arteriosclerosis and hypertension.

Ruth Webster Lathrop, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1891; at one time associate professor of physiology at the Temple University School of Medicine; aged 78; died, July 31, of chronic myocarditis.

Russell Walter Goebel, Oak Park, Ill.; University of Illinois College of Medicine, Chicago, 1925; member of the Illinois State Medical Society; aged 40; died, July 31, at his summer home near Wauconda of sclerosis of the liver.

Manly Lafayette Cummins, Ashford, Ala.; Medical College of Alabama, Mobile, 1906; member of the Medical Association of the State of Alabama; aged 63; died, July 28, in a hospital at Birmingham of carcinoma of the lung.

Fridolin John Otto Kraushaar, Aberdeen, S. D.; State University of Iowa College of Medicine, Iowa City, 1909; member of the South Dakota State Medical Association; aged 54; died, June 26, of coronary occlusion.

William Baum Small ✠ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1893; for many years on the staff of the Lankenau Hospital; aged 70; died, July 27, of intraventricular hemorrhage.

David Robinson ✠ Tillamook, Ore.; Harvard Medical School, Boston, 1906; secretary and past president of the Tillamook County Medical Society; county health officer; aged 66; died, July 27, of cerebral hemorrhage.

Timothy Francis Cotter, Haverhill, Mass.; Baltimore Medical College, 1906; member of the Massachusetts Medical Society; aged 57; died, July 3, in the Hale Hospital of carcinoma of the rectum with metastases.

John Bloomfield Beekman ✠ Bedminster, N. J.; University of the City of New York Medical Department, New York, 1882; aged 86; died, July 10, in the Overlook Hospital, Summit, following an operation on the prostate.

Chester LeRoy Goldsmith, Winchester, N. H.; Maryland Medical College, Baltimore, 1912; member of the New Hampshire Medical Society; aged 59; died, July 26, of coronary occlusion and myocarditis.

Irwin Scott Flegal, Karthaus, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1894; member of the Medical Society of the State of Pennsylvania; aged 75; died, August 28, of coronary occlusion.

Xenia Ethel Bond, Salem, W. Va.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, Chicago, 1905; aged 69; died, July 23, in a hospital at Clarksburg.

Edgar E. Noel, Huntington, W. Va.; College of Physicians and Surgeons, Baltimore, 1884; aged 80; died, July 18, at St. Mary's Hospital of complications following a fractured hip, received in a fall.

Walter Scott Abbott Kimball, Rumford Point, Maine; Medical School of Maine, Portland, 1898; aged 68; died, May 20, of coronary sclerosis, phlebitis and transurethral resection of the prostate.

William S. Love ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1890; aged 73; died, May 13, in the Bon Secours Hospital of lobar pneumonia and acute nephritis.

John P. Kerrigan, Rutland, Vt.; Chicago College of Medicine and Surgery, 1915; served during the World War; aged 47; died, July 29, of coronary thrombosis and diabetes mellitus.

Hugh Arthur Johnston, Port Burwell, Ont., Canada; University of Toronto Faculty of Medicine, 1894; for many years associate coroner of Elgin County; aged 68; died, June 21.

Avery Barnes McGill, San Francisco; University of the City of New York Medical Department, New York, 1892; aged 76; died, July 17, of a self-inflicted bullet wound.

Ernest M. Rast, Cameron, S. C.; Medical College of the State of South Carolina, Charleston, 1898; formerly mayor; aged 69; died, July 5, of arteriosclerosis and uremia.

Walter Henderson, Hawarden, Sask., Canada; McGill University Faculty of Medicine, Montreal, Que., 1894; aged 74; died, May 1, in Spokane, Wash., of leukemia.

Frank William Love ✠ Buffalo; University of Buffalo School of Medicine, 1897; aged 70; died, July 21, of cerebral hemorrhage, arteriosclerosis and hypertension.

Edwin Morgan Ripley, Collinsville, Conn.; Eclectic Medical College of the City of New York, 1871; aged 92; died, June 5, of bronchopneumonia and arteriosclerosis.

Frank L. Blachly Sr., Moline, Ill.; College of Physicians and Surgeons, Baltimore, 1881; aged 80; died, July 27, in the Lutheran Hospital of mesenteric thrombosis.

Joseph Peter Bilodeau, Vancouver, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., Canada, 1913; aged 55; died, July 29, in Kamloops.

William Charles Mardorf ✠ St. Louis; St. Louis Medical College, 1888; an Affiliate Fellow of the American Medical Association; aged 73; died, May 5.

Thomas P. Matheny, Bardwell, Texas; Dallas Medical College, 1903; aged 73; died, July 9, in the Municipal Hospital, Ennis, of coronary occlusion.

Spero M. Salpas, Chicago; University of Illinois College of Medicine, Chicago, 1917; aged 55; died, May 2, of cerebral embolism and mitral insufficiency.

Charles Alexander Ault, Enterprise, Ore.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1890; aged 76; died, July 31, of uremia.

Isaac Henry Clement, Marion, Ky.; University of Tennessee Medical Department, Nashville, 1885; aged 78; died, June 18, of coronary thrombosis.

Thomas Francis Taylor, San Diego, Calif.; Bellevue Hospital Medical College, New York, 1880; aged 83; died, May 21, of mesenteric thrombosis.

Charles Frederick Dorsey, Innisfail, Alta., Canada; University of Toronto Faculty of Medicine, 1908; aged 55; died, June 30, of heart disease.

Daniel Harris Baker, Gadsden, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; aged 79; died, July 29, of myocarditis.

William Frederick Edwards, Airdrie, Alta., Canada; McGill University Faculty of Medicine, Montreal, Que., 1907; aged 60; died, June 22.

Willis Pomeroy Polhemus, San Diego, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1881; aged 84; died, May 1.

Hugh Burns Hay, Chipman, N. B., Canada; University of the City of New York Medical Department, New York, 1887; aged 81; died, July 16.

Roderick Donald Dewar, Melbourne, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1908; aged 58; died, May 18.

Arthur Wellesley Allingham, Broadview, Sask., Canada; Trinity Medical College, Toronto, 1891; formerly mayor; aged 75; died, May 12.

Nathan E. Lawson, Oklahoma City; Hospital College of Medicine, Louisville, Ky., 1898; aged 66; died, May 7, of myocarditis.

Mary Cochran McIntyre, Roxbury, Conn.; University of Glasgow Medical Faculty, Scotland, 1909; aged 55; died, May 12.

John James McPherson, Castor, Alta., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1909; died, May 11.

Gordon Lemon McFarlane, Carbon, Alta., Canada; University of Toronto Faculty of Medicine, 1911; aged 50; died in May.

Joseph Lawrence Bettag, Kimball, S. D.; Marquette University School of Medicine, Milwaukee, 1924; aged 49; died, May 9.

Susan L. Halverson Lamb, San Francisco; State University of Iowa College of Medicine, Iowa City, 1885; aged 79; died, May 4.

Bureau of Investigation

ROBERT FAUDREE—MEDICAL IMPOSTOR

Charlatan Finds California Climate Unhealthy

The California State Board of Medical Examiners, under the direction of the secretary, Charles B. Pinkham, M.D., has for years maintained an extensive and efficient group of investigators. These special agents have long been a thorn in the side of impostors, irregulars and those who exceed their legal rights in practicing the healing arts in the state of California.

On June 28, 1940, T. P. Hunter, a special agent for the board, had occasion to investigate one Robert Gordon Faudree, who appears to have used at that time another name, Gilbert Gordon Faudree. He had appeared at the University of California Hospital at San Francisco and claimed to have attended the Louisiana State University School of Medicine and to have completed his medical course in India. While at the San Francisco hospital he wore a smock bearing the legend "Charity Hospital, New Orleans." He was described as being about 25 years of age, 5 feet 9 inches in height, weighing 160 pounds, and as having light brown hair, blue eyes and a sunburned complexion. He is said to have spoken with either a southern or a British accent. It seems that his principal attire was a green gabardine suit the jacket of which was double breasted and had brass buttons. He claimed that it was the yachting costume of the Bombay Yacht Club. He had also been observed wearing this jacket with white duck pants and also wearing a gold ring in the shape of a cobra, with green stones as eyes.

A San Francisco police report No. 338793 had been issued against him because on June 6 he had checked out from the University of California Medical School Library several magazines and books. While at the Medical School he claimed that his father was in charge of a hospital in Calcutta and that he was interested in observing obstetric cases. This apparently led to his receiving permission to sleep in one of the obstetric "ready" rooms. Since he made no attempts either to borrow money or to cash checks, his chief purpose in posing as a physician at the hospital seems to have been to obtain lodging.

With the permission of the hospital authorities, Faudree delievered an informal lecture at the nurses' home on the subject of medicine in India. He became friendly with two student nurses there and told them he was sailing for India on the S. S. *President Adams* on the 22d of June. He gave one of the girls the address of 39 Lahora Road, Calcutta, Bengal, India, as an address where he could receive mail. As a matter of fact, he had made no attempt to secure reservations on the *President Adams* but had made them for Calcutta on a Pan-American Airways plane, giving his address as the University of California Hospital.

By July 12 it had been intimated to the investigators that Faudree was located at the Mendocino State Hospital at Talmage, Calif. They also developed the information that his parents were located in Dayton, Ohio. By this time information had come from New Orleans that this individual was formerly an employee of the Charity Hospital of Louisiana under the name of Faudree de Fauche. He was an x-ray technician there from June 1, 1939, to March 9, 1940.

The investigators were able to locate him at the Mendocino institution where he had obtained employment commencing July 1 as a laboratory technician at a salary of $160 per month less maintenance. He informed the superintendent of the institution that he had been referred there by the state board of health as an applicant for a temporary (noncivil service) appointment for the position.

At this time it developed that after he had left the employ of the Charity Hospital at New Orleans he went to San Francisco and stowed away on a freighter, which took him as far as Penang, but, not being allowed to land, he was returned to San Francisco June 1, about the time when he appeared at the University of California Medical School. In connection with the position at the Mendocino State Hospital, he was issued a temporary laboratory technician's certificate on the basis of information, which he supplied, to the effect that he had attended the University of Calcutta, India, from September 1931 to June 1935, obtaining the degree of "B.Sc.Md.," had attended the School of Tropical Medicine in Calcutta from September 1935 to June 1939, when he obtained the degree "Doctor of Tropical Medicine," had thereafter worked in the Pathological Laboratory of the Carmichael Hospital, Calcutta, from June to October 1939, and claimed to have worked at the same institution as a "pathological intern" [sic]. He also claimed work in clinical diagnosis and claimed to have a provincial license in medicine in the province of Bengal, India.

On the basis of these facts it was decided to issue a complaint against Faudree for petty theft, and the special agent of the Board of Medical Examiners arrested him on July 24 in the laboratory of the Mendocino State Hospital, where he was able to recover the property which had been stolen from the Library of the University of California Medical School. "After intensive interrogation," Faudree admitted to the agent that he had never attended the University of Calcutta and that his whole story as to medical qualifications was false and, incidentally, that he had not intended to return the stolen property. He was booked at the Mendocino County Sheriff's office as No. 1259, and en route to San Francisco the agent had him booked again at the Sonoma County Sheriff's office as No. 6717.

From S.F News - page 15 - Issue of 7-25-40

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Agent Hunter decided a little straight - from - the - horse's - mouth action was called for. He went to the Mendocino hospital and, in effect, told Faudree "you're a faker." Faudree admitted he'd never been closer to Calcutta than Mendocino County. And his wide knowledge of medical matters, he said, was acquired while he worked for a dentist in a Florida laboratory. Judge Dunn found him guilty of petty theft, suspended the sentence on Faudree's promise to return to his home in Dayton.

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Newspaper account of Faudree's career in California.

Faudree appeared in the San Francisco municipal court before Judge Frank Dunn, in action 465612, on July 25, and pleaded guilty to petty theft (see clipping reproduced on this page). As the property had been recovered and there was no indication of a previous record, either in California, Dayton, Ohio, his home town, or New Orleans, or in the Federal Bureau of Investigation, Judge Dunn imposed a sentence of six months in the county jail, which he suspended on condition that Faudree return to his parents' home in Dayton.

When apprehended, Faudree had in his possession a box of calling cards which he had had printed, and on which his name appeared with the prefix "Dr."

Robert Faudree may be only a first offender, but the ease with which he duped his victims might indicate previous experience or the likelihood of future performances.

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the Iowa State Medical Society; aged 50; died, July 8, in a hospital at Springfield, Ohio, of coronary occlusion and cerebral embolism.

John E. Fuller, Paris, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1888; member of the State Medical Association of Texas; aged 78; on the staff of the Sanitarium of Paris, where he died, July 20, of cerebral hemorrhage.

Archie Phelps Campbell, East Ellsworth, Wis.; University of Pennsylvania School of Medicine, Philadelphia, 1924; member of the State Medical Society of Wisconsin; on the staff of the City Hospital, River Falls; aged 46; died, July 15, of heart disease.

Thomas Irving Packard, Lanark, Ill.; Rush Medical College, Chicago, 1895; member of the Illinois State Medical Society; for many years president of the school board; aged 75; died, July 4, of cerebral embolism, arteriosclerosis and hypertension.

Ruth Webster Lathrop, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1891; at one time associate professor of physiology at the Temple University School of Medicine; aged 78; died, July 31, of chronic myocarditis.

Russell Walter Goebel, Oak Park, Ill.; University of Illinois College of Medicine, Chicago, 1925; member of the Illinois State Medical Society; aged 40; died, July 31, at his summer home near Wauconda of sclerosis of the liver.

Manly Lafayette Cummins, Ashford, Ala.; Medical College of Alabama, Mobile, 1906; member of the Medical Association of the State of Alabama; aged 63; died, July 28, in a hospital at Birmingham of carcinoma of the lung.

Fridolin John Otto Kraushaar, Aberdeen, S. D.; State University of Iowa College of Medicine, Iowa City, 1909; member of the South Dakota State Medical Association; aged 54; died, June 26, of coronary occlusion.

William Baum Small ✠ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1893; for many years on the staff of the Lankenau Hospital; aged 70; died, July 27, of intraventricular hemorrhage.

David Robinson ✠ Tillamook, Ore.; Harvard Medical School, Boston, 1906; secretary and past president of the Tillamook County Medical Society; county health officer; aged 66; died, July 27, of cerebral hemorrhage.

Timothy Francis Cotter, Haverhill, Mass.; Baltimore Medical College, 1906; member of the Massachusetts Medical Society; aged 57; died, July 3, in the Hale Hospital of carcinoma of the rectum with metastases.

John Bloomfield Beekman ✠ Bedminster, N. J.; University of the City of New York Medical Department, New York, 1882; aged 86; died, July 10, in the Overlook Hospital, Summit, following an operation on the prostate.

Chester LeRoy Goldsmith, Winchester, N. H.; Maryland Medical College, Baltimore, 1912; member of the New Hampshire Medical Society; aged 59; died, July 26, of coronary occlusion and myocarditis.

Irwin Scott Flegal, Karthaus, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1894; member of the Medical Society of the State of Pennsylvania; aged 75; died, August 28, of coronary occlusion.

Xenia Ethel Bond, Salem, W. Va.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, Chicago, 1905; aged 69; died, July 23, in a hospital at Clarksburg.

Edgar E. Noel, Huntington, W. Va.; College of Physicians and Surgeons, Baltimore, 1884; aged 80; died, July 18, at St. Mary's Hospital of complications following a fractured hip, received in a fall.

Walter Scott Abbott Kimball, Rumford Point, Maine; Medical School of Maine, Portland, 1898; aged 68; died, May 20, of coronary sclerosis, phlebitis and transurethral resection of the prostate.

William S. Love ✠ Baltimore; University of Maryland School of Medicine, Baltimore, 1890; aged 73; died, May 13, in the Bon Secours Hospital of lobar pneumonia and acute nephritis.

John P. Kerrigan, Rutland, Vt.; Chicago College of Medicine and Surgery, 1915; served during the World War; aged 47; died, July 29, of coronary thrombosis and diabetes mellitus.

Hugh Arthur Johnston, Port Burwell, Ont., Canada; University of Toronto Faculty of Medicine, 1894; for many years associate coroner of Elgin County; aged 68; died, June 21.

Avery Barnes McGill, San Francisco; University of the City of New York Medical Department, New York, 1892; aged 76; died, July 17, of a self-inflicted bullet wound.

Ernest M. Rast, Cameron, S. C.; Medical College of the State of South Carolina, Charleston, 1898; formerly mayor; aged 69; died, July 5, of arteriosclerosis and uremia.

Walter Henderson, Hawarden, Sask., Canada; McGill University Faculty of Medicine, Montreal, Que., 1894; aged 74; died, May 1, in Spokane, Wash., of leukemia.

Frank William Love ✠ Buffalo; University of Buffalo School of Medicine, 1897; aged 70; died, July 21, of cerebral hemorrhage, arteriosclerosis and hypertension.

Edwin Morgan Ripley, Collinsville, Conn.; Eclectic Medical College of the City of New York, 1871; aged 92; died, June 5, of bronchopneumonia and arteriosclerosis.

Frank L. Blachly Sr., Moline, Ill.; College of Physicians and Surgeons, Baltimore, 1881; aged 80; died, July 27, in the Lutheran Hospital of mesenteric thrombosis.

Joseph Peter Bilodeau, Vancouver, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., Canada, 1913; aged 55; died, July 29, in Kamloops.

William Charles Mardorf ✠ St. Louis; St. Louis Medical College, 1888; an Affiliate Fellow of the American Medical Association; aged 73; died, May 5.

Thomas P. Matheny, Bardwell, Texas; Dallas Medical College, 1903; aged 73; died, July 9, in the Municipal Hospital, Ennis, of coronary occlusion.

Spero M. Salpas, Chicago; University of Illinois College of Medicine, Chicago, 1917; aged 55; died, May 2, of cerebral embolism and mitral insufficiency.

Charles Alexander Ault, Enterprise, Ore.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1890; aged 76; died, July 31, of uremia.

Isaac Henry Clement, Marion, Ky.; University of Tennessee Medical Department, Nashville, 1885; aged 78; died, June 18, of coronary thrombosis.

Thomas Francis Taylor, San Diego, Calif.; Bellevue Hospital Medical College, New York, 1880; aged 83; died, May 21, of mesenteric thrombosis.

Charles Frederick Dorsey, Innisfail, Alta., Canada; University of Toronto Faculty of Medicine, 1908; aged 55; died, June 30, of heart disease.

Daniel Harris Baker, Gadsden, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; aged 79; died, July 29, of myocarditis.

William Frederick Edwards, Airdrie, Alta., Canada; McGill University Faculty of Medicine, Montreal, Que., 1907; aged 60; died, June 22.

Willis Pomeroy Polhemus, San Diego, Calif.; University of Michigan Homeopathic Medical School, Ann Arbor, 1881; aged 84; died, May 1.

Hugh Burns Hay, Chipman, N. B., Canada; University of the City of New York Medical Department, New York, 1887; aged 81; died, July 16.

Roderick Donald Dewar, Melbourne, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1908; aged 58; died, May 18.

Arthur Wellesley Allingham, Broadview, Sask., Canada; Trinity Medical College, Toronto, 1891; formerly mayor; aged 75; died, May 12.

Nathan E. Lawson, Oklahoma City; Hospital College of Medicine, Louisville, Ky., 1898; aged 66; died, May 7, of myocarditis.

Mary Cochran McIntyre, Roxbury, Conn.; University of Glasgow Medical Faculty, Scotland, 1909; aged 55; died, May 12.

John James McPherson, Castor, Alta., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1909; died, May 11.

Gordon Lemon McFarlane, Carbon, Alta., Canada; University of Toronto Faculty of Medicine, 1911; aged 50; died in May.

Joseph Lawrence Bettag, Kimball, S. D.; Marquette University School of Medicine, Milwaukee, 1924; aged 49; died, May 9.

Susan L. Halverson Lamb, San Francisco; State University of Iowa College of Medicine, Iowa City, 1885; aged 79; died, May 4.

Bureau of Investigation

ROBERT FAUDREE—MEDICAL IMPOSTOR

Charlatan Finds California Climate Unhealthy

The California State Board of Medical Examiners, under the direction of the secretary, Charles B. Pinkham, M.D., has for years maintained an extensive and efficient group of investigators. These special agents have long been a thorn in the side of impostors, irregulars and those who exceed their legal rights in practicing the healing arts in the state of California.

On June 28, 1940, T. P. Hunter, a special agent for the board, had occasion to investigate one Robert Gordon Faudree, who appears to have used at that time another name, Gilbert Gordon Faudree. He had appeared at the University of California Hospital at San Francisco and claimed to have attended the Louisiana State University School of Medicine and to have completed his medical course in India. While at the San Francisco hospital he wore a smock bearing the legend "Charity Hospital, New Orleans." He was described as being about 25 years of age, 5 feet 9 inches in height, weighing 160 pounds, and as having light brown hair, blue eyes and a sunburned complexion. He is said to have spoken with either a southern or a British accent. It seems that his principal attire was a green gabardine suit the jacket of which was double breasted and had brass buttons. He claimed that it was the yachting costume of the Bombay Yacht Club. He had also been observed wearing this jacket with white duck pants and also wearing a gold ring in the shape of a cobra, with green stones as eyes.

A San Francisco police report No. 338793 had been issued against him because on June 6 he had checked out from the University of California Medical School Library several magazines and books. While at the Medical School he claimed that his father was in charge of a hospital in Calcutta and that he was interested in observing obstetric cases. This apparently led to his receiving permission to sleep in one of the obstetric "ready" rooms. Since he made no attempts either to borrow money or to cash checks, his chief purpose in posing as a physician at the hospital seems to have been to obtain lodging.

With the permission of the hospital authorities, Faudree delievered an informal lecture at the nurses' home on the subject of medicine in India. He became friendly with two student nurses there and told them he was sailing for India on the S. S. *President Adams* on the 22d of June. He gave one of the girls the address of 39 Lahora Road, Calcutta, Bengal, India, as an address where he could receive mail. As a matter of fact, he had made no attempt to secure reservations on the *President Adams* but had made them for Calcutta on a Pan-American Airways plane, giving his address as the University of California Hospital.

By July 12 it had been intimated to the investigators that Faudree was located at the Mendocino State Hospital at Talmage, Calif. They also developed the information that his parents were located in Dayton, Ohio. By this time information had come from New Orleans that this individual was formerly an employee of the Charity Hospital of Louisiana under the name of Faudree de Fauche. He was an x-ray technician there from June 1, 1939, to March 9, 1940.

The investigators were able to locate him at the Mendocino institution where he had obtained employment commencing July 1 as a laboratory technician at a salary of $160 per month less maintenance. He informed the superintendent of the institution that he had been referred there by the state board of health as an applicant for a temporary (noncivil service) appointment for the position.

At this time it developed that after he had left the employ of the Charity Hospital at New Orleans he went to San Francisco and stowed away on a freighter, which took him as far as Penang, but, not being allowed to land, he was returned to San Francisco June 1, about the time when he appeared at the University of California Medical School. In connection with the position at the Mendocino State Hospital, he was issued a temporary laboratory technician's certificate on the basis of information, which he supplied, to the effect that he had attended the University of Calcutta, India, from September 1931 to June 1935, obtaining the degree of "B.Sc.Md.," had attended the School of Tropical Medicine in Calcutta from September 1935 to June 1939, when he obtained the degree "Doctor of Tropical Medicine," had thereafter worked in the Pathological Laboratory of the Carmichael Hospital, Calcutta, from June to October 1939, and claimed to have worked at the same institution as a "pathological intern" [sic]. He also claimed work in clinical diagnosis and claimed to have a provincial license in medicine in the province of Bengal, India.

On the basis of these facts it was decided to issue a complaint against Faudree for petty theft, and the special agent of the Board of Medical Examiners arrested him on July 24 in the laboratory of the Mendocino State Hospital, where he was able to recover the property which had been stolen from the Library of the University of California Medical School. "After intensive interrogation," Faudree admitted to the agent that he had never attended the University of Calcutta and that his whole story as to medical qualifications was false and, incidentally, that he had not intended to return the stolen property. He was booked at the Mendocino County Sheriff's office as No. 1259, and en route to San Francisco the agent had him booked again at the Sonoma County Sheriff's office as No. 6717.

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Newspaper account of Faudree's career in California.

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Correspondence

MYASTHENIA GRAVIS

To the Editor:—In reading the report by Dr. Robert C. Moehlig on his case of myasthenia gravis recently published (Myasthenia Gravis: Treatment by Implantation of Desoxycorticosterone Acetate Pellets, THE JOURNAL, July 13, p. 123), I was struck by the fact that little effort was made to confirm the diagnosis of this rare and somewhat obscure disease. The rapid onset of symptoms over a period of seven days to a point of orthopnea and prostrating fatigue is certainly unusual in myasthenia gravis. It appears from the examination that the patient had bilateral ptosis, dysphagia, dysarthria and general weakness, all symptoms which are consistent with the diagnosis, but it is not clearly indicated that he had the primary symptom of myasthenia gravis, namely fatigue on muscular motion with recovery after rest. This, moreover, was not brought out by the Jolly reactions, nor is there a record of the other tests now commonly used to confirm the diagnosis. These tests are the "prostigmine test," devised by a number of workers to evaluate the effect of prostigmine when injected intramuscularly, electromyograms, ergograms and fluoroscopic studies of barium ingestion. The most important of these tests is the "prostigmine test," which should always be done if there is any doubt about the diagnosis and is particularly important in a case such as that described by Dr. Moehlig when the diagnosis may be not entirely clear. If one is to draw any conclusions in regard to any type of therapy, one should be certain that the patient under observation has the disease in question in an unmistakable and unequivocal manner.

One notes with interest, moreover, that the patient was given quinine as one of the forms of treatment. It has been well recognized in recent years that quinine is one of the drugs that will make the symptoms of myasthenia gravis more pronounced, whereas its pharmacologic antagonist, prostigmine, will improve the symptoms. There is a certain danger in using quinine, for the symptoms of myasthenia gravis may become so pronounced under medication with this drug that respiratory failure will ensue. Dr. Moehlig reports only "unpleasant effects" of this drug and does not make it clear what these effects were.

To evaluate any form of treatment in a disease such as myasthenia gravis is indeed difficult. The periods of remission may be acute and practically complete. Patients as seriously ill as the one described by Dr. Moehlig have been known to recover their normal state of health within a week or less. One would wish, therefore, before conclusions are drawn about the efficacy of a drug or glandular preparation to be not only as certain as possible in regard to the diagnosis of this unusual disease but also sure that the patient was not passing into a stage of remission rather than a stage of recovery due to a specific medication.

HENRY R. VIETS, M.D., Boston.

To the Editor:—I wish to call your attention to the dangerously misleading impression that might be read into Dr. R. C. Moehlig's report of a case of myasthenia gravis in THE JOURNAL, July 13. From the way in which the therapeutic trial of quinine is referred to in this report, one might easily deduce that the drug has been elsewhere reportedly used successfully in the treatment of this disease, especially since it was here administered together with aminoacetic acid. Actually, quinine is definitely contraindicated, as was reported by Kennedy and Wolf (*Arch. Neurol. & Psychiat.* **37**:68 [Jan.] 1937). Later, Harvey showed that quinine has a curare-like action, as he reported in THE JOURNAL, April 22, 1939, page 1562, and thus its administration enhances the curare-like paralysis of myasthenia gravis. I have seen 10 grains (0.65 Gm.) of quinine produce an alarming state in a moderately severe case of myasthenia gravis.

It is regrettable that no mention is made of the use of prostigmine to verify the diagnosis of the case reported. As it is, the clinical course described can just as easily be interpreted as a textbook picture of nonfatal botulism. The abrupt onset is certainly more typical of botulism than of myasthenia gravis.

In any event, it is to be hoped that the further progress of the case will be reported, no matter what the outcome, so that one may learn whether the improvement reported was spontaneous or a direct result of the substitution therapy with desoxycorticosterone.

LEO D. FREYDBERG, M.D., Granville, N. Y.

CHRONIC CARBON MONOXIDE POISONING

To the Editor:—Because of the number of cases of alleged chronic carbon monoxide poisoning which are getting into the courts, the article entitled "Carbon Monoxide—A Domestic Hazard, with Especial Reference to the Problem in West Virginia," by Harvey G. Beck, Wilmer H. Schulze and George M. Suter, which appeared in THE JOURNAL, July 6, page 1, deserves comment.

There is no question of the importance of true acute carbon monoxide poisoning which leads to coma and death or to complete recovery except for neurologic complications in rare instances. These authors imply that chronic carbon monoxide poisoning is a common cause of a great multiplicity of symptoms. In only one or two of their cases do the criteria given seem adequate to establish significant exposure to carbon monoxide. The number of patients in a similar environment who did not show any symptoms is not mentioned. In only two cases is the blood level of carbon monoxide hemoglobin mentioned, and in these cases the time after exposure is not stated. Figures are not given as to the actual concentration of carbon monoxide found in the localities in which persons were alleged to be exposed, although in one or two instances a dangerous concentration was said to have been found without the figure being stated.

Among the statements that seem open to question are the following: on page 2 "Coronary thrombosis has repeatedly been observed clinically and at autopsy as well as in experimental animals in states of carbon monoxide anoxemia"; on page 6 "The basal metabolism is uniformly low in carbon monoxide anoxemia," and the implication on page 3 that a red blood cell count of over 5,000,000 constitutes a polycythemia. Actually, the average red cell count for men is 5,400,000, and counts well over 6,000,000 are not infrequently encountered in healthy men.

The authors fail to give the criteria by which they exclude other etiologies for the symptoms mentioned. The fact that they mention specifically such a wide variety of diseases or syndromes simulated by these symptoms, including angina pectoris, multiple sclerosis, hemiplegia, tetany, neuroses, psychoses, cardiospasm, pylorospasm, spastic constipation, gastric achylia, nocturia, dysuria, anemia and polycythemia, to mention only a few, suggests that other diagnoses rather than carbon monoxide poisoning account for these symptoms.

Other conditions are much more important and common causes of the symptoms mentioned. The authors fail to present evidence that the symptoms mentioned were actually due to exposure to carbon monoxide. Carefully controlled experiments by Yandell Henderson and by the U. S. Bureau of Mines failed to show any significant sequelae from exposures to carbon monoxide not leading to prolonged unconsciousness.

EDWIN E. OSGOOD, M.D.
JOSEPH BEEMAN, M.D.
Portland, Ore.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

POLIOMYELITIS AND TONSILLECTOMY

To the Editor:—**Some time ago I noticed an article in The Journal which tended to show that it was hazardous to do tonsillectomies during the fall season for the reason that it increased liability to the contraction of infantile paralysis, the latter disease being more prevalent at that season of the year. Is this the contention of specialists in general and has the contention been proved to a satisfactory degree? It has always seemed to me that more patients submit to tonsillectomy just before the beginning of the school year in September than at any other time. Any information you can give me along this line will be appreciated.**

M.D., Iowa.

Because of the importance of this question it was submitted to two consultants, whose respective replies follow:

ANSWER.—There is little doubt that tonsillectomy predisposes to poliomyelitis of the bulbar type only. This predisposition has been noted whenever it has been sought for in the epidemics of the last five years. This phenomenon was first reported by Aycock and Luther in 1929 (*New England J. Med.* **200:**164 [Jan. 24] 1929). These authors noted that, of thirty-six children who had contracted poliomyelitis and who also had tonsillectomies within a year, the operation had been performed from seventeen to eighteen days preceding the onset of disease in sixteen. This interval corresponds exactly with the known incubation period of the disease in man.

In most epidemics of poliomyelitis the bulbar type makes up but 10 to 15 per cent of the total cases. It is thought that tonsillectomy bares nerve endings in the tonsillopharyngeal area, allowing the virus to enter the nervous system over these free nerve endings, it being assumed that such a person was a carrier of the virus at the time the operation was performed. That human carriage of virus is not infrequent has been shown by several investigators. Not only is the virus probably carried in the nasopharynx in certain persons, but it is also harbored in the gastrointestinal secretions, certainly in the active cases of convalescents of the disease. It has been detected in two cases in sewage.

The most recent and complete report on this question is to be found in the article by Stellerman and Fisher, "Acute Bulbar Poliomyelitis Following Recent Tonsillectomy and Adenoidectomy," in the *American Journal of Diseases of Children* (**56:**778 [Oct.] 1938)

Experimental studies by Sabin on monkeys (THE JOURNAL, Aug. 13, 1938, p. 605) have shown that the tonsillopharyngeal region is more highly sensitive to poliomyelitis virus than many regions of the body, and the type of the disease so produced when experimental is bulbar and bulbospinal. This author was successful in producing experimental poliomyelitis by first removing tonsils surgically and then spraying virus into the throat. The experimental disease was produced only when spray containing the virus was administered to the experimental animal within a few hours after surgical removal of the tonsils.

Trauma elsewhere in the oral cavity may possibly predispose to poliomyelitis infection. A report by Gard (Nouvelles recherches sur l'épidémiologie de la poliomyélite, Office international d'hygiène publique **30:**933 [May] 1938) states that two cases of poliomyelitis followed extraction of teeth, in both of these cases the onset of disease corresponding to the known incubation period of poliomyelitis in man. There has been no confirmation as yet.

It would appear that in the absence of an epidemic there is little or no more hazard of submitting children to tonsillectomy during the summer and fall months than at any other time.

In light of the available information, one would be inclined to defer tonsillectomy in the presence of an epidemic.

ANSWER.—Clinically there does not appear to be any evidence that a tonsillectomy is a predisposing factor to infantile paralysis. This is borne out by the great number of operations performed in the fall of the year without any apparent material increase in the number of cases of infantile paralysis.

Although a number of investigators have reported, in different series of observations, a small group of cases of infantile paralysis of the bulbar type that occurred at varying intervals after tonsillectomy, it is a question whether or not this finding is coincidental. Sabin (Experimental Poliomyelitis by the Tonsillopharyngeal Route, THE JOURNAL, Aug. 13, 1938, p. 605), in experimental work on monkeys, has shown that bulbar paralysis can occur more readily after a tonsillectomy, progressing along the local peripheral nerves. To occur postoperatively the virus would have to be present in secretions or in the tonsils during the operation, and infection would be facilitated by any procedure involving injections or postoperative suturing.

From these observations it can be deduced that it is unwise to perform a tonsillectomy in the presence of a local epidemic of this disease, but it is questionable in the opinion of most men whether one should adopt a "rule of thumb" to avoid a tonsillectomy in the fall merely on the ground that there is a greater prevalence of poliomyelitis at that time.

Concerning the question of the incidence of tonsillectomies, certain localities show a preponderance of operations immediately following the closing of the school term, with a second but smaller frequency peak in September. This varies in different parts of the country.

COLOR BLINDNESS

To the Editor:—**A white man aged 55 shows complete red-green color blindness with the Ishihara chart. However, he passes the Jennings color test perfectly. He has never noticed any difficulty in recognizing colors. He worked in millinery and in piece goods departments where matching colors is essential, and he was acknowledged to be one of the best color matchers in the store. He has no difficulty with traffic lights, recognizing the red, green and yellow lights instantaneously. Can you explain why he should be classed as red-green color blind, and if color blindness was a test for employment would the Ishihara or the Jennings test be accepted? Also, can you explain why he should be red-green color blind with one test and not with the other?**

M.D., Tennessee.

ANSWER.—It is common knowledge that an anomalous deuteranope will be unable to read the red-green figures in the Ishihara and Stilling charts and still be able to pick out red and green colors accurately. This is due to the fact that the colors in the Ishihara and Stilling charts are borderline, the greens being almost gray, and that is the point at which these patients have difficulty. The latest edition of the Ishihara chart is not satisfactory and only the first edition should be used for testing. It is reliable for most color blind patients. The army has discarded both the Ishihara and Stilling charts for color blind testing because of their failure in cases such as the one described and now relies entirely on the old fashioned skeins of yarn for testing color blindness.

FECAL STREPTOCOCCI AND URTICARIA

To the Editor:—**We have a patient with chronic urticaria of about sixteen months' duration. She has had the usual skin sensitization tests and has been getting theelin and nonspecific desensitization treatments with typhoid vaccine. The only specific desensitization treatment has been with a vaccine of Streptococcus viridans found in the stool in nearly pure culture. The use of this vaccine subcutaneously in the proper dosage has resulted in the disappearance of the urticarial eruption except for the appearance of a few lesions when the interval between treatments has been too prolonged, and the improvement in her general condition has kept pace with the cutaneous improvement. What treatment, if any, might be available to eradicate the intestinal focus of sensitization? This method of treatment, if successful, might obviate the necessity for hyposensitization treatment with much earlier and more satisfactory results. The positive culture of Streptococcus viridans was obtained from an ordinary stool, and it would seem that the infection might be in the colon or lower part of the colon. I have had in mind the use of gentian violet coated capsules prepared so as to dissolve in the colon, Bacillus acidophilus, sulfanilamide or some derivative.**

M.D., Arizona.

ANSWER.—Streptococcus viridans is so commonly found in the stools of human beings that its importance in such a cutaneous condition seems doubtful.

Much has been said and written concerning the intestine as a focus in chronic diseases. Often apparent relationship between poor intestinal elimination and such conditions as arthritis, chronic cutaneous disease and general debility seems to be at hand. No adequate proof of such a relationship, however, is available. True enough, when proper bowel function is established, or even after intestinal irrigations are instituted, improvement in the systemic condition is sometimes noted. In individuals with inflammatory diseases of the bowel, such as ulcerative colitis, systemic complications like those mentioned may occur. In these cases the eradication of the colitis will frequently result in the disappearance of the cutaneous or other systemic manifestations. However, when no bowel disease is noted and only Streptococcus viridans in the stool is present, the eradication of this streptococcus, changing the intestinal flora through diet and the like, will rarely if ever have any effect on the cutaneous condition. In short, it is most difficult to establish any relation between the presence of this organism and a cutaneous condition such as urticaria.

However, bacterins prepared from organisms isolated from the stools, even though actual lesions in the bowel are absent,

have been commonly used. It has also been a common practice to change intestinal flora by giving acidophilus milk, but such a change is usually temporary. Of the various drugs mentioned, gentian violet could be used without probable harmful effect. All in all, it seems rather doubtful that the cutaneous condition could be aided much by removing Streptococcus viridans from the stool or by desensitizing the patient against it.

The best and most discussed method as well as the one yielding apparent results in some cases so far as eradicating the streptococci seems to be by the injection of a bacterin prepared from the streptococci in individual cases.

VITAMIN D FOR ADULTS

To the Editor:—At a recent postgraduate institute a speaker stated that the administration of vitamin D in the form of cod liver oil, viosterol and the like should be restricted to children and is contraindicated for all adults, as this vitamin causes demineralization of bones. Will you kindly advise me whether this opinion is commonly held true or not?

Calvert R. Toy, M.D., New Brunswick, N. J.

ANSWER.—There is no evidence that a moderate amount of vitamin D causes demineralization of the bones of adults or produces any adverse effects. Indeed there is some evidence that reasonable amounts of vitamin D, such as 400 U. S. P. units daily, may be beneficial, particularly during adolescence. While no need for supplies of vitamin D other than the effect produced by ordinary exposure to sunlight has been shown for the average normal adult, there is considerable evidence that many women require vitamin D in order to remain in calcium equilibrium during pregnancy and lactation.

VASECTOMY AND PERSISTENCE OF SPERMATOZOA

To the Editor:—What observations have been made as to the length of time spermatozoa can persist in the seminal vesicles when their testicular source of supply has been blocked by a vasectomy? I recently have seen two patients who had a vas resection performed over a year ago but who continue to show occasional nonmotile spermatozoa on microscopic examination of the ejaculate. I can hardly conceive of an opening in the vas so small as to allow only the passage of a few spermatozoa; neither can I believe that spermatozoa will continue to be present in the vesicles for as long a period as a year.

M.D., Oklahoma.

ANSWER.—The consensus among practicing urologists is in effect that spermatozoa may remain in the seminal vesicles after a bilateral vasectomy for as long a period as from twelve to sixteen weeks. This depends on the frequency of sexual intercourse. Some men are of the opinion that sperms lose their motility at the end of about forty-five or fifty days after vasectomy. Most important in a situation such as this is to be definitely sure that a vasectomy has actually been performed and that the cut ends of the vas deferens were widely separated. There are instances in which the vas was simply cut and not widely separated, the vas grew together and the lumen was reestablished and hence sperms were found. A similar situation may also occur in cases in which subcutaneous ligation of the vas has been performed.

CONGENITAL ENTROPION

To the Editor:—I have recently seen a 3 months old baby with bilateral entropion of the lower lids, which the mother states has been present for about two months. There is only slight inflammation of the bulbar conjunctiva and apparently there are no subjective symptoms. The baby is quite plump, there is apparently no edema of the lids and the urine is normal. Please suggest treatment and prognosis without treatment.

Curtis M. Galt, M.D., Manteca, Calif.

ANSWER.—Congenital entropion is by no means a rare condition and usually under conservative treatment relieves itself after a short period of from three to six months. If the lashes are so turned in that they strike both the conjunctiva and the cornea, irritation of these tissues may call for more active treatment. A palliative measure which has good results is the use of adhesive tape to pull the lid out. The upper portion of the tape should be placed just below the lash line and as the lid is pulled away from the eyeball the remainder of the strip is pasted on the cheek. If such procedures are inadequate, surgery may be indicated. The simplest surgical procedure is the one made so well known by Dr. Ziegler of Philadelphia, which is as follows: Just below the lash line on the surface of the skin, small cautery punctures are made throughout the extent of the entropion. When these scars heal there is definite tendency for the lid to turn out and the skin surface, after a short time, shows no scarring. Other surgical procedures are the removal of a strip of skin below the lash line and connecting of the incised area. At times it may be necessary to remove a portion of the orbicularis muscles for the best effect. As a rule, the prognosis in this type of entropion is good without treatment.

VISUAL DISTURBANCES FROM DIGITALIS

To the Editor:—I digitalized a man aged 74 with generalized arteriosclerosis and chronic auricular fibrillation. Owing to an error in reading his weight on a new scale, I gave him in two days about 0.3 Gm. of digitalis over that required on the basis of 0.1 Gm. per 10 pounds (4.5 Kg.) of body weight. He had mild nausea and vomited once, but his most troublesome toxic symptom, which has persisted two weeks without ameliaration, is green vision, especially when he looks at lights. I stopped the maintenance dose for five days, then put him back on 0.1 Gm. a day. Is this toxic effect dangerous? Does it cause any permanent damage? Can I do anything to rid him of it? How long, on the average, do such visual disturbances persist if digitalis maintenance doses are continued?

M.D., Ohio.

ANSWER.—Disturbances of vision, especially seeing various colored lights and occasionally transient blindness, has long been noted to occur during the administration of digitalis. When it occurs, it is evidence of excess dosage, although on occasion it may occur with small doses as a result of idiosyncrasy. No permanent harmful effects will result from this disturbance in vision provided the digitalis is discontinued. It is a definite indication that digitalis must be stopped and discontinued until all symptoms have disappeared. Care should be employed in readministering digitalis to such patients, since the symptoms can easily recur. It is a wise procedure to explore other varieties of digitalis leaf, since it occasionally happens that the patient is more tolerant to a different species of digitalis leaf or to some squill product. There is no specific antidote for this complication other than the prompt discontinuance of the digitalis. It must be recalled that digitalis has a large cumulative effect and the reduction in dosage alone may not be sufficient to reduce the concentration of digitalis in the body tissues. This accounts for the continuation of the symptoms with the administration of daily doses of 0.1 Gm. It should be reemphasized that the digitalis should be stopped entirely when this symptom is found.

PROBABLE FRÖHLICH SYNDROME

To the Editor:—A boy who was 14 years old on November 27 is 5 feet 3 inches (160 cm.) tall, weighs 145 pounds (66 Kg.), is from 34 to 37 inches (86 to 94 cm., expiration-inspiration) around the chest, 32 inches (81 cm.) around the waist and 40 inches (102 cm.) around the trochanters. The inseam is 30 inches (76 cm.). He has developed no secondary sex characteristics. The testes and penis are small. He is a typical moderately fat boy type. He excels in school work, has a brilliant personality and is not feminine in the least way. He is well liked by his playmates. His mother is about 5 feet 4 inches (163 cm.) tall and comes from an average size normal family. The father is 6 feet 1 inch (185 cm.) tall and weighs about 235 pounds (107 Kg.). He has always been well developed muscularly and always a little overweight. He played college football. He did not develop sexually until he was almost 17 years old, and although his sex organs have always been small he has always been virile. The father's hair became thin at 21 years of age, when hair began to develop all over the body. The paternal grandfather was of the same type, with two uncles and two cousins of similar body build. Do you think it would be advisable to give the boy some growth stimulating hormone? If so please advise which preparations you consider best.

M.D., Iowa.

ANSWER.—This description fits Fröhlich's syndrome, although the actual size of development of the genitalia is not definite. Undoubtedly such a patient ought to be placed on a reducing diet in order to bring the obesity under control. Endocrine therapy is not necessary or advisable for this purpose. Whether or not any growth promoting hormone should be used would depend on the rate at which the boy has been growing in the last year and on whether x-ray study of the femurs showed that the epiphyses are still nonunited so that growth can continue. If he has not been growing approximately 2 inches (5 cm.) in the last year and if the epiphyses are still not united, then growth promoting pituitary hormone would probably be indicated.

SEDIMENTATION TEST IN RHEUMATIC FEVER

To the Editor:—What is the prevailing attitude now on using the sedimentation rate as a criterion for regulating activity in adults or children following an attack of acute rheumatic arthritis?

I. H. Wilson, M.D., Worthington, Minn.

ANSWER.—There appears to be general agreement among physicians interested in rheumatic fever that a rapid sedimentation rate is of considerable importance in the evaluation of the presence of active rheumatic fever. It is perhaps the most valuable single nonspecific laboratory test. An elevated white blood count and a prolongation of auriculoventricular conduction time by electrocardiogram are also helpful. Other causes of a fast sedimentation rate must be considered prior to its acceptance as indicating active rheumatic fever. It must also be remembered that the sedimentation rate may remain fast for two or three weeks following infection of the upper respiratory tract in nonrheumatic as well as rheumatic individuals.

There is, however, a difference between the regulation of physical activity of rheumatic fever patients and the evaluation of the presence or absence of active rheumatic fever. The sedimentation rate is generally valuable in determining the latter. Many other factors must be considered in directing the physical activity of a patient with recent clinical rheumatic fever. In general, most workers strive to restrict the patient's activity, even to give bed rest, as long as rheumatic fever continues to be active. Laboratory tests may be persistently abnormal without clinical symptoms, indicating a continuation of mild rheumatic fever. This period of active rheumatic fever may last for months or even years, and hence the problem is a difficult one. The sedimentation rate is, however, a valuable guide in following the course of the active rheumatic fever in a given case.

MERCURIAL DISINFECTANTS

To the Editor:—We recently had in our office a detail man who made the statement that the United States Public Health Service refused to accept mercuric cyanide as a potent antiseptic even if used in a solution of 1:300 for fifteen minutes. He made the statement that ureteral catheters could not be sterilized by the drip method if mercuric cyanide 1:500 was used. This, he said, was also true of urethral catheters which were placed in mercuric cyanide 1:500 and left for thirty minutes. He stated that the interior of the catheter continued to yield viable staphylococci when it had been so infected. Please give us what data you have with regard to this subject.

W. G. Schulte, M.D., Salt Lake City.

ANSWER.—Not only mercuric cyanide but also other mercurial disinfectants, when used in the concentrations usually recommended, were found by Brewer (THE JOURNAL, May 20, 1939, p. 2009) not to kill bacterial spores exposed to the disinfectants for twenty-four hours. Nonsporulating bacteria are more easily killed. Instruments with hinges, crevices or canals are not likely to be sterilized by chemical solutions unless there is a forced circulation of the solutions through them. The mercurial compounds are known to be much more bacteriostatic than bactericidal. Under certain circumstances they may be useful antiseptics but are not good sterilizing agents.

CHAULMOOGRA OIL FOR LARYNGEAL TUBERCULOSIS

To the Editor:—Is the painting of the larynx with chaulmoogra oil of recognized value in the treatment of tuberculous laryngitis and, if so, would it be likely to cause an acute hemorrhagic nephritis over a period of about one month?

C. W. Atherton, M.D., Marshall, Ill.

ANSWER.—It is debatable whether chaulmoogra oil is of real value in the cure of tuberculous laryngitis. Certainly the enthusiasm for this therapy is not what it once was, and few have achieved the excellent results of some of the early reporters.

Spencer believes that the oil has some value as a mild, palliative and perhaps curative remedy; Myerson, however, who also has had a large experience, is convinced that the oil does not have curative effect but is of value as a temporary soothing and cleansing agent. He does not believe that any larynx which it has apparently cured would not have been healed without it.

The results in animal experimentation have not been remarkable.

It is not likely that chaulmoogra oil acts as the cause of acute hemorrhagic nephritis. True, injections of sodium hydnocarpate, a closely related compound with similar actions, has been reported to have produced albuminuria and hematuria in rabbits and dogs. Reports of such toxic effects in man, however, when the drug is used locally, as in the case of tuberculous laryngitis, are wanting.

References:

Jackson, Chevalier, and Jackson, C. L.: The Larynx and Its Diseases, Philadelphia, W. B. Saunders Company, 1937.
Lukens, R. M.: Laryngeal Tuberculosis, in Jackson, Chevalier, and Coates, G. M.: The Nose, Throat and Ear and Their Diseases, Philadelphia, W. B. Saunders Company, 1929.
Spencer, Robert: Laryngeal Tuberculosis, Philadelphia, J. B. Lippincott Company, 1927.

SWIMMING IN PREGNANCY

To the Editor:—Is there any objection to a primipara, apparently in good health, going swimming? I have given advice, perhaps old fashioned, against swimming because of the sudden shock to a person who is already carrying a double load.

M.D., New York.

ANSWER.—There is no serious objection to a healthy primipara swimming during the first seven months of the gestation. The water in which the patient swims should be relatively clean and warm. The water at the crowded beaches or large urban centers on hot summer days is usually contaminated and is not a desirable place for the pregnant patient. Lower genital tract infections can and do occur in such environments.

HYPERKERATOTIC EPIDERMOPHYTOSIS

To the Editor:—A woman aged 54 has had a dermatitis of both hands and feet for twenty-six months. This was diagnosed as epidermophytosis by the family physician and a dermatologist. She received roentgen treatments every two weeks for eight months before consulting a specialist. He treated her with potassium permanganate and also various ointments containing coal tar products and salicylic acid with no results. She has been using numerous proprietary drugs and had "shots" given by a cultist. I saw her about four weeks ago, at which time the hands were covered on the palms by thickened tough skin which, when removed, left a red sensitive surface which itches and burns. The patient was off work as a beauty operator for five months while the lesions were in the weeping stage but noticed slight improvement. No cutaneous tests have been done; the blood count was normal except for 11,200 white cells, with a normal differential count. The only improvement followed accidental use of formaldehyde on the hands. What tests would you suggest? Would formaldehyde be safe to use and if so what strength? Would sodium thiosulfate or any other form of medication offer anything? Would roentgen therapy be safe to use again in combination with local fungicides?

M.D., Indiana.

ANSWER.—As the patient's work is that of a beauty operator, one might suspect an occupational dermatitis if her feet were not also involved. In cases of this type it is difficult to make a positive diagnosis, but from the history given the condition is most probably a hyperkeratotic type of epidermophytosis. In all hyperkeratotic lesions on the palms and soles the possibility of previous arsenic ingestion should be considered. The patient should not have any more radiotherapy. Sodium thiosulfate 15 grains (1 Gm.) several times a week may prove to be of value. Warm soaks twice daily in a solution of sodium biborate followed by the application of salicylic acid and benzoic acid ointment should also prove to be of benefit. The first ointment should consist of salicylic acid 1 part, benzoic acid 2 parts and rosewater ointment and petrolatum to make 30 parts. Later the strength of this ointment can be doubled.

ACID AND ALKALI BURNS

To the Editor:—What is the present method of treating industrial caustic burns?

M.D., Mississippi.

ANSWER.—E. C. Davidson (*Ann. Surg.* **85**:481 [April] 1927) made an experimental study of the treatment of acid and alkali burns. He concluded that "the results obtained in the treatment of experimentally produced alkali and acid burns were decidedly better when the caustic agent was removed by dilution with water than when rendered inert by neutralization. When treatment by neutralization is employed it should only be employed after the maximum amount of the caustic has been removed by thorough washing."

CONCERNING RADIATION AND HEREDITY—DIAGNOSTIC X-RAY AND FETAL ABNORMALITIES

To the Editor:—On page 1836, The Journal, Nov. 27, 1937, a physician asks to be enlightened on the chances a woman has of producing normal children when fertility has been temporarily suspended by x-rays and radium. Your answer states that "her chances for having normal children are just as good as those of women who have not received radiation therapy." This answer is correct as far as the immediate offspring is concerned; but injury may become manifest in the progeny of her children. Not sufficient time has elapsed to observe whether or not the human race is just as susceptible to such remote injuries as numerous animal species (among them animals as closely related to us as mice). The next sentence of your answer reads "There has been controversy on this subject, but the consensus is that radiation therapy applied before fertilization of an ovum does no harm." This too calls for some qualification. To quote just one of the authentic dissenting opinions I refer to Colwell and Russ, who advise strongly against temporary sterilization of women who may afterward bear children (X-Ray and Radium Injuries, London, Oxford University Press, 1934). More recently at least four prominent American authors have gone on record as being of the same opinion.

On page 2455, The Journal, June 10, 1939, the question is raised whether diagnostic x-ray exposures during pregnancy may cause fetal monstrosities. After setting forth the conventional teaching that diagnostic x-ray procedures during pregnancy, if not applied in unduly large quantity, do not harm the child or the ovaries, The Journal continues "Only recently have any objections been heard to the foregoing statement, but these are from abroad and are deductions from experiments on plants." The objections originated in the United States and are based primarily and mainly on animal experiments. (Muller, H. J.: Roentgen Rays and Heredity in Otto Glasser's book "The Science of Radiology," Springfield, Ill., Charles C. Thomas, 1933). These objections are made in view of possible damage to later generations. The subject matter underlying both these queries and their answers, namely, radiation and heredity, is involved and complex. At the same time it is of great practical importance to every physician who applies or has others apply x-rays for diagnosis and treatment, even though this importance may not be sufficiently appreciated. I have made an attempt to present the subject at greater length and in nontechnical language in my article "The Importance of a New X-Ray Effect for Our Daily Diagnostic and Therapeutic X-Ray Work" (*New York State J. Med.*, Aug. 1, 1940). An extensive bibliography can be found in this article.

Siegfried W. Westing, M.D., Brooklyn.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, August 31, page 800.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II, Sept. 11-13, to be given in medical centers having five or more candidates desiring to take the examination. Part III, Baltimore and New York during October and Boston during November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers, Feb. 20. Final date for filing application is December 21. *Oral.* Cleveland, May 31-June 1. Final date for filing application is April 1. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Various centers, Oct. 28. Applications must be on file not later than Sept. 16. *Oral.* Chicago, Dec. 6-7. Applications for Group A must be on file not later than Nov. 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, Oct. 18-19. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville, Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Part I Group B examinations, locally, Jan. 4, 1941, at 2:00 P. M. Part II, Groups A and B, Cleveland, Ohio, June 1941, immediately prior to opening of A. M. A. meeting. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh, Pa.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Cleveland, Oct. 5. *Written.* Various centers, March 8. *The only written examination during 1941.* Applications must be on file not later than Dec. 1. A special oral and clinical examination will be held on the Pacific Coast during 1941 providing there will be enough candidates to warrant it. Applications for this examination should be on file not later than Sept. 15. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and written.* New Orleans, January 1941. Final date for filing application is November 15. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: New York, March 30-31. Following the Region I meeting of the American Academy of Pediatrics. Chicago, May 18. Following the Region III meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, December 18-19. Final date for filing application is October 8. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Boston, Sept. 26-29. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Part I. Various centers, October 21. Final date for filing application is September 15. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Oral and Written.* Chicago, February 1941. Applications must be on file not later than Oct. 15. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Florida June Report

Dr. William M. Rowlett, secretary, Florida State Board of Medical Examiners, reports the written examination for medical licensure held at Tampa, June 17-18, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Eighty-one candidates were examined, seventy-eight of whom passed and three failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
George Washington University School of Medicine		(1932)	1
Georgetown University School of Medicine		(1935, 3)	3
Emory University School of Medicine		(1937), (1940, 6)	7
University of Georgia School of Medicine		(1937), (1939), (1940, 8)	10
Northwestern University Medical School		(1940), (1940)*	2
Rush Medical College		(1924), (1937), (1938)	3
University of Illinois College of Medicine		(1923), (1937), (1940)	3
Indiana University School of Medicine		(1938)	1
University of Kansas School of Medicine		(1930)	1
University of Louisville School of Medicine		(1939)	1
Louisiana State University School of Medicine		(1940)	1
Tulane University of Louisiana School of Medicine		(1932), (1940, 3)	4
Johns Hopkins University School of Medicine		(1926), (1933)	2
University of Maryland School of Medicine and College of Physicians and Surgeons		(1932)	1
Harvard Medical School		(1937)	1
Tufts College Medical School		(1939)	1
University of Michigan Medical School		(1938)	1
Wayne University College of Medicine		(1940)	1
University of Minnesota Medical School		(1928), (1931)	2
University of Nebraska College of Medicine		(1928)	1
Albany Medical College		(1937)	1
Columbia University College of Physicians and Surgeons		(1917), (1921), (1935), (1940)	4
Cornell University Medical College		(1928)	1
Fordham University School of Medicine		(1919)	1
Long Island College Hospital		(1929)	1
Long Island College of Medicine		(1938)	1
New York Medical College, Flower and Fifth Avenue Hospitals		(1938)	1
New York University College of Medicine		(1936)	1
Duke University School of Medicine		(1937), (1940, 2)	3
Starling-Ohio Medical College		(1914)	1
Ohio State University College of Medicine		(1936)	1
University of Cincinnati College of Medicine		(1937), (1938)	2
Jefferson Medical College of Philadelphia		(1938)	1
Temple University School of Medicine		(1935), (1940)	2
University of Pennsylvania School of Medicine		(1937)	1
Meharry Medical College		(1938), (1940, 3)	4
University of Tennessee College of Medicine		(1931), (1937, 2)	3
Vanderbilt University School of Medicine		(1928)	1
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen		(1922)	1

School	FAILED	Year Grad.	Number Failed
Harvard Medical School		(1917)	1
University of Michigan Medical School		(1925)	1
University of Virginia Department of Medicine		(1929)	1

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Tennessee June Report

Dr. H. W. Qualls, secretary, Tennessee State Board of Medical Examiners, reports the written examination for medical licensure held at Knoxville, Memphis and Nashville, June 14-15, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eighteen candidates were examined, 117 of whom passed and one failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1940)	85.8, 90.2
Howard University College of Medicine		(1939)	88.9
Emory University School of Medicine		(1938)	87
Northwestern University Medical School		(1930) (1939)	88.1, 85.3
Washington University School of Medicine		(1940)	86.3
Temple University School of Medicine		(1940)	89.1
University of Pennsylvania School of Medicine		(1940)	92.5
Meharry Medical College	84.3, 85.3, 85.3, 85.4, 85.5, 85.5, 85.6, 85.7, 85.9, 86.1, 86.9, 86.9, 87.1, 87.2, 87.3, 87.4, 87.6, 87.6, 87.7, 87.8, 88.1, 88.1, 88.1, 88.5, 88.5, 88.7, 88.8, 88.9, 88.9, 89.1, 89.3, 89.4, 89.8, 90.4, 91, 97.2	(1940)	83.5,
University of Tennessee College of Medicine	86.8, 87.3, 87.3, 87.4, 87.4, 88, 88.7, 89.1, 89.1, 89.5, 89.6, 89.6, 89.6, 90.7, 90.9, 91.6	(1940)	86.1,
Vanderbilt University School of Medicine	84.7, 84.9, 85.9, 86.3, 86.9, 87.4, 87.4, 87.5, 87.8, 87.9, 87.9, 88.1, 88.3, 88.3, 88.3, 88.4, 88.4, 88.4, 88.6, 88.6, 88.7, 88.7, 88.8, 88.8, 88.9, 89, 89, 89, 89.1, 89.2, 89.3, 89.3, 89.4, 89.4, 89.5, 89.6, 89.6, 89.7, 89.8, 89.9, 90, 90.1, 90.2, 90.3, 90.4, 90.6, 90.9, 91.6, 92, 92.2	(1940)	83.3,
Medical College of Virginia		(1938)	86.8
University of Toronto Faculty of Medicine		(1938)	91.1, 93.8

School	FAILED	Year Grad.	Number Failed
Meharry Medical College		(1929)	1

Sixteen physicians were licensed to practice medicine by reciprocity from May 28 through July 27. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine		(1933)	Ohio
University of Georgia School of Medicine		(1934), (1937)	Georgia
University of Louisville School of Medicine		(1939)	Kentucky
Tulane University of Louisiana School of Medicine		(1929)	Louisiana
Johns Hopkins University School of Medicine		(1926), (1937, 2)	Maryland
Columbia University College of Physicians and Surgeons		(1936)	New York
University of Cincinnati College of Medicine		(1930)	Ohio
Hahnemann Med. College and Hospital of Philadelphia		(1934)	Penna.
University of Pennsylvania School of Medicine		(1931)	Penna.
University of Tennessee College of Medicine		(1939)	Mississippi
University of Texas Faculty of Medicine		(1926)	Texas
Medical College of Virginia		(1917)	Maryland
University of Virginia Department of Medicine		(1939)	Virginia

Book Notices

Proximate Composition of American Food Materials. By Charlotte Chatfield, Foods and Nutrition Specialist, and Georgian Adams, Associate Food Chemist, Foods and Nutrition Division, Bureau of Home Economics. United States Department of Agriculture Circular No. 549. Paper. Price, 15 cents. Pp. 92. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

The comprehensive tables prepared by Atwater and Bryant on the chemical composition of foods have not been revised since 1906. It is appropriate therefore that the Department of Agriculture again should issue an authoritative booklet on the composition of foods. The data in this report were obtained chiefly from published records of analysis that have been made in many laboratories by different investigators using different methods. A considerable number of results of unpublished analyses likewise are included, but the authors state that for the most part they have studied the original records critically. Data are provided for about 2,000 foods. The information includes the name of the food, the nature of the sample, the basis of the analytical figures, the percentage of refuse and of the constituents of the edible portion in terms of water, protein, fat, ash, total carbohydrates, fiber, sugars, starch and acid, and fuel value per hundred grams and per pound. The tables are more conveniently arranged than they have been in many compilations because the individual foods are listed alphabetically. The report includes many data on the composition of vegetables, fruits and meats heretofore available only in separate publications. The tables will prove useful for dietary calculations and invaluable for the approximate estimation of dietary ingredients such as is necessary in formulating a diet for persons with diabetes. There is a separate table listing fruits and vegetables in groups containing about 3 per cent carbohydrate, about 6 per cent carbohydrate and so on, according to a familiar classification.

Unlike the compilation by Atwater and Bryant, the present tables do not provide a range of values or the number of analyses. While the authors state in their introductory remarks that variations are to be expected in foods, the tables provide only the average values, and this fact may be easily overlooked. Raw potatoes, for example, are stated to contain 19.1 per cent of total carbohydrates. The tables of Atwater and Bryant show the total carbohydrates for this food to be from 13.5 to 27.4 per cent, with the average of 136 analyses as 18.4 per cent. In this connection the title of the present report may be especially appropriate if "proximate" is taken to mean "almost correct."

It would be helpful to many users of such a compilation if somewhat larger type could be used for the tables. While the present compilation may be of inestimable value, particularly for the formulation of diets for diabetic patients, there are other data which are assuming great importance for the physician. The amount of calcium, phosphorus and iron in foods would constitute useful knowledge. Even data on the relative amounts of sodium and potassium in foods is coming to assume importance in the modern dietary management of Addison's disease. Perhaps such data may be made available in future compilations just as there now is a fairly recent compilation of data regarding the vitamin content of foods.

Neoplastic Diseases: A Treatise on Tumors. By James Ewing, A.M., M.D., Sc.D., Professor of Oncology at Cornell University Medical College, New York City. Fourth edition. Cloth. Price, $14. Pp. 1,160, with 581 illustrations. Philadelphia & London: W. B. Saunders Company, 1940.

Twelve years has elapsed since the previous edition of this great book was published. A multitude of contributions on neoplastic diseases has appeared from all points of the scientific circle—physics, chemistry, physiology, pathology, clinical medicine and genetics—in the interim, necessitating extensive revision of many sections and the rewriting of some of the forty-nine chapters of the book. Dr. Ewing is most ably fitted to present a critical review of this expanding knowledge and to collect from the innumerable sources the essential facts and principles. He has omitted much historical material from this edition to make room for new contributions and yet has kept the volume within reasonable space. The general plan of the book remains the same. The author combats the theory that tumors fall into a limited number of grand classes in which the forms occurring in the several organs are so nearly related as to be virtually identical. The practicing physician has been content to regard all cases of general classes of tumors as equivalent conditions without regard to the organ involved and to treat the members of each class alike. On this theory was born the conception of a universal causative agent of malignant tumors, a point of view that has greatly retarded progress. To combat this conception, Dr. Ewing analyzes the many factors which meet in the inception of tumors. He emphasizes the dependence of the clinical course on histologic structure, traces the histogenesis and contrasts the striking clinical features which often are characteristic of different tumors. The first nine chapters are of a general nature, dealing with theories, the chemistry of tumors, pathology, malignancy, metastases, experimental cancer research and the history, definition and classification of tumors. In the other forty chapters, which the author terms collectively "special oncology," he takes up different kinds of tumors, beginning with fibromas, which are discussed with regard to sites, origin, clinical types and histologic groups. Other chapters are on tumors of the breast, carcinoma of the stomach, maxillary tumors of dental origin, tumors of the kidney, tumors of the testes, myeloma, tumors of the hypophysis, teratology, tumors of nerve trunks, brain tumors, lymphoma, endothelial sarcoma and tumors of the pancreas. The illustrations have been made almost entirely from photographs. The extensive bibliography is arranged in the back of the book under the same general headings as are the chapters.

Vitamin D: Chemistry, Physiology, Pharmacology, Pathology, Experimental and Clinical Investigations. By C. I. Reed, A.M., Ph.D., Associate Professor in Physiology, H. C. Struck, M.S., Ph.D., Associate in Physiology, and I. E. Steck, M.S., M.D., Instructor in Physiology and in Medicine, Department of Physiology and Department of Medicine, College of Medicine, University of Illinois, Chicago. Cloth. Price, $4.50. Pp. 389, with 13 illustrations. Chicago: University of Chicago Press, 1939.

The authors of this book are among the chief proponents of the use of massive doses of vitamin D in the treatment of arthritis, "pollinosis" and a variety of clinical conditions other than rickets. Therefore it is not surprising to find that this is not the conventional review of vitamin D which its title suggests but, on the contrary, is essentially a defense of the empirical use of vitamin D as a pharmacologic agent. The earlier chapters of the book are devoted to a brief review of the chemistry of vitamin D, the relative potency of various forms of the vitamin (including the several forms of vitamin D milk), a description of biologic and chemical methods for determining vitamin D, and a discussion of the physiologic effects of the vitamin, including its possible mode of action in the prevention or healing of rickets. Throughout the review much space is given to reports of the work of foreign investigators, although these reports are not always critically evaluated and although the results may not have been adequately confirmed. The review of the literature is not as well balanced as could be desired, and although in places the review reads smoothly, all too frequently the reader is confused by the lack of adequate classification and by the quotation of conflicting data with no advance warning that they will be conflicting. Too often also articles are reviewed which the authors state have been available only in abstract. It is difficult to understand why the description of methods for the determination of vitamin D is restricted almost entirely to those used abroad, while no mention is made of the technic adopted by the U. S. Pharmacopeia and the Association of Official Agricultural Chemists, which is standard in the United States for the assay of vitamin D in food and pharmaceutic materials. It is perhaps not so difficult to understand the large amount of space devoted to the discussion of "Vitamin D-Stoss," a method developed and used almost exclusively in Germany for the treatment of rickets with single massive doses (from 200,000 to 600,000 international units) of a crystalline preparation of vitamin D. An example of the type of controversial material frequently included in this book is the discussion of the alleged aphrodisiac effects of vitamin D. This discussion, unfortunately, confuses libido with ovarian function and apparently is not based on adequate knowledge of sexual physiology.

The chief value of the book lies in the detailed reports of the authors' own studies of the toxicity of vitamin D and of their own observations of the effects of massive doses of vitamin D on blood chemistry and on calcium and phosphorus balance.

Observations on a total of 166 subjects are reported, the results of which may be summarized by the statement that the authors claim to have found that, in the recommended dosage of from 200,000 to 300,000 international units a day, immediate "toxication" is relatively rare and readily detected in its early stages. In the studies of calcium and phosphorus metabolism the intake of these minerals was uncontrolled and in the large majority of instances considerably below the standard minimum daily requirement. Also the possible presence or absence of calcium stores was not taken into account in the interpretation of the results. However, the results reported indicate that, in the words of the authors, "there is no conventional picture of mineral metabolism in arthritis and . . . no characteristic response to vitamin D that can be considered in this relation." The authors state further "It is clear . . . that vitamin D does not completely restore the subject to a normal state, probably because it does not generally correct the fundamental disturbance that made the subject susceptible in the first place. Therefore, when the subject reaches the state when no further clinical improvement is apparent, it is useless to continue this treatment. Other measures must then be employed." Nevertheless they insist that vitamin D is of value in relieving the symptoms of arthritis at least temporarily. The objection that the clinical investigations were not adequately controlled and that the relief of symptoms might be due to a remission of the disease has not been satisfactorily met. The book contains a forty-eight page bibliography which is said to contain more than 900 references. It is well printed and contains numerous tables and graphs. This book should be of interest to the physiologist or the physician who may profitably explore the more speculative and controversial phases of our knowledge of vitamin D, but it is not to be recommended as either an authoritative or well balanced review of established knowledge concerning the chemistry or physiology of this vitamin.

It is perhaps not out of place in a review of this sort to point out also that the commercial preparation Ertron, a high vitamin D potency preparation marketed by the Nutrition Research Laboratories, is exploited as a treatment for arthritis in advertising which leans heavily on the work of Dr. Reed and his associates. This preparation has been declared not acceptable by the Council on Pharmacy and Chemistry. Significantly in the prefatory material of the book there occurs acknowledgment of the receipt of financial aid from the Nutrition Research Laboratories. The index shows nine references to the product Ertron.

Actuarial Technique and Financial Organisation of Social Insurance: Compulsory Pension Insurance. By Lucien Féraud. International Labour Office. Studies and Reports Series M (Social Insurance) No. 17. Paper. Price, $4; 15s. Pp. 568. Washington, D. C. & Geneva: International Labour Office (League of Nations); London: P. S. King & Son, Ltd., 1940.

Only three of the risks that can be covered by social insurance are considered in this volume—those of invalidity, old age and death. The treatment consists of a general introductory discussion followed by monographs on Belgium, Czechoslovakia, France, Great Britain and Italy.

While compulsory sickness insurance is not directly discussed, much of the actuarial and descriptive matter, both of which are very exhaustive, cannot help but be of value to any one concerned with the organization of almost any type of social insurance. The difficulties which hamper actuarial calculations in these fields are pointed out. Because "there have been incessant modifications" in all such systems, and such modifications have been made by legislation or regulation without much regard for actuarial conditions, it is very difficult to lay down rules by which accurate calculations can be made. In the first place there is nearly always a complete lack of statistics "concerning the group that it is proposed to insure . . . the insured group is large, scattered, and constantly liable to variation." Furthermore, "there is no social insurance scheme in existence which has operated without modification long enough to include only persons . . . who have been subject to the same legislation since they were at the lowest age limit for entering insurance." The actuary "must take into account a host of financial, economic, social and even political considerations." It is recognized that insurance itself often produces important effects such as increasing the amount of invalidity. In addition to many valuable statistical tables concerning the operation of various systems of insurance there are complicated mathematical formulas which are applied in the effort to establish norms for the diverse elements involved in the financial calculations required.

An Atlas of the Commoner Skin Diseases with 120 Plates Reproduced by Direct Colour Photography from the Living Subject. By Henry C. G. Semon, M.A., D.M., F.R.C.P., Physician for Diseases of the Skin, Royal Northern and Hampstead General Hospitals, London. Photography under the direction of Arnold Moritz, B.A., M.D., B.C. Second edition. Cloth. Price, $12. Pp. 272. Baltimore: William Wood & Company, 1940.

This dermatologic reference book presents in one compact volume, at a reasonable price, 120 Finlay color plates to illustrate the dermatoses most frequently seen in routine practice. Opposite each plate is a short clinical description of the disorder presented, with a practical outline of treatment and an occasional helpful table of differential diagnosis. The various diseases are arranged in convenient alphabetical order. The photography, by Arnold Moritz, is excellent. The illustrations are taken not from moulages but directly from living subjects and they are accurately reproduced to maintain lifelike color values. The cases have been selected intelligently to bring out the cardinal clinical features of each disease, and in the portrayal in color there is a depth or third dimensional effect which is lacking when the illustrations are in the usual black and white. The volume is not intended to be a textbook but rather an accessory aid to the student and practitioner in the detailed study of diseases of the skin. To this end it succeeds admirably and the author, artist and publishers are to be congratulated on the contribution they have made.

Biokhimiya adrenalina. [By] A. M. Utevskiy. [Biochemistry of Adrenalin]. Cloth. Price, 8 rubles. Pp. 302. Kiev: Izdanie Ukrainskogo Instituta Eksperimentalnoy Meditsiny, 1939.

Problems pertaining to the biochemistry of epinephrine did not receive the exhaustive treatment in literature accorded the physiology and the pharmacology of epinephrine. The author points out that, as a hormone and a substance genetically and functionally related to the mediators of the sympathetic nervous system, epinephrine presents a most important and fascinating subject for biochemical investigation. In attempting to present a systematic treatment of the fundamental problems of the biochemistry of epinephrine the author utilizes the accepted theories and hypotheses as well as his own ideas based on the investigations carried out in his laboratory. The volume contains eight chapters dealing with the chemistry, the role of secretion, the various forms in which epinephrine exists in the living organism, epinephrine as a mediator of sympathetic nervous impulses, the chemical nature of sympathenes, the formation of epinephrine, the oxidation products of epinephrine and the role of epinephrine in metabolism and in the dynamics of the hepatic and the muscle cell. The volume is a timely contribution to an important subject. Unfortunately, it does not contain a summary in any of the accessible languages.

A Text-Book of Psychiatry for Students and Practitioners. By D. K. Henderson, M.D., F.R.F.P.S., F.R.C.P.E., Physician-Superintendent of the Royal Edinburgh Hospital for Mental Disorders, Edinburgh, and R. D. Gillespie, M.D., F.R.C.P., D.P.M., Physician for Psychological Medicine, Guy's Hospital, London. Fifth edition. Cloth. Price, $6. Pp. 660. New York & London: Oxford University Press, 1940.

Five editions of this textbook indicate the established place which it has made for itself in the field that it concerns. The new edition gives a detailed outline of the insulin and metrazol shock technics. Indeed, the authors point out that these methods in individual instances have accomplished brilliant results, have infused psychiatric treatment with new enthusiasm and have added directly and indirectly to research along clinical, chemical and biochemical lines. Psychiatrists are still concerned with new methods for classification of mental disturbances. New additions have been made to the discussions of heredity and to the play technic for the treatment of nervous children. Also some attention has been added to the considerations of the new trend in the field of psychosomatic medicine. The chapter on epilepsy calls attention to recent investigations with the encephalogram. It is the belief of the authors that the sheet anchor of treatment is bromide, with a useful accessory in phenobarbital. They believe that dilantin sodium is a valuable alternate for phenobarbital.

Trudy Instituta im. Gannushkina. Vypusk tretly. Pod redaktsiey T. A. Geyera i S. G. Zhislina et al. Vypusk chetverty: Psikhiatricheskaya bolnitsa. Pod obshchiey redaktsiey M. Z. Kaplinskogo i S. V. Kraytsa, et al. [Works of Gannushkin Institute for Neuro-Psychiatric Research. Part 3. Part 4: Psychiatric Hospital.] Cloth. Price, 12 rubles, 50 kopeks; 13 rubles. Pp. 312; 326, with illustrations. Moscow, 1939.

Volume III contains papers reporting the work of the institute for the past two years devoted to the subjects of the symptomatology and therapy of schizophrenia. Particularly interesting is the paper by A. C. Kronfeld, in which the author reviews the extensive historical material regarding the concepts of schizophrenia leading up to its formulation by Kraepelin. The convulsive-irritative methods of therapy are described and at the same time emphasis is laid on the need of physical therapeutic measures such as hydrotherapy and electrotherapy.

Volume IV is devoted principally to the problems of organization of a psychiatric hospital and to the problems of the patient after his discharge from the hospital. No particularly new or interesting views are disclosed. The need for accuracy in statistical studies of therapeutic results is emphasized.

A Synopsis of Surgery. By Ernest W. Hey Groves, M.S., M.D., B.Sc., Consulting Surgeon to the Bristol General and Municipal Hospitals, Bristol. Eleventh edition. Cloth. Price, $5. Pp. 714, with 208 illustrations. Baltimore: William Wood & Company, 1940.

From a purely pedagogic point of view a synopsis may be objectionable if the student relies on it as his sole source of information. While it makes it easier for him to memorize facts for the next examination, it is just as easily forgotten soon after, for the mental process involved in reading a more or less complete text is eliminated. The author with his wide experience as teacher did not from the beginning intend the work to be anything else than a supplement to the major textbooks. As such, this volume may well prove to be of aid to the student in rapidly surveying the entire field. Regarded in this light the volume is easily the best in its class and may be unreservedly recommended to the senior medical student and to the so-called busy practitioner. The popularity of the work is attested by the many editions through which it has passed since its first appearance in 1908.

Voprosy nevrorentgenologii. Pod redaktsiey B. N. Mankovskogo, Ya. I Geynismana. Questions neuro-radiologiques. Cloth. Price, 15 rubles. Pp. 266, with illustrations. Kiev: Gosudarstvennoe Meditsinskoe Izdatelstvo USSR, 1939.

The volume contains some of the more important papers presented at the session of neuroroentgenologists of the Kiev Psychoneurologic Institute in 1936. The papers deal with roentgenologic study of the various anatomic questions pertaining to the skull and the spinal dural sac, the various roentgenologic methods such as craniography, myelography and encephalography, and the value of roentgenology in diagnosis and localization of brain tumors. The character of the work as reflected in these papers appears to be abreast of the present day advances in the field. Each paper has a brief summary in French.

A Check List for the Survey of Health and Physical Education Programs in Secondary Schools. By Terry H. Dearborn, School of Hygiene and Physical Education, Stanford University. Paper. Price, 60 cents. Pp. 23, Stanford University, California: Stanford University Press, 1940.

This pamphlet is one of the many appraisal devices which are being used more and more extensively in public health, social service and educational fields. This outline includes eight major divisions, of which the first is a description of the school and community, the second deals with organization and administration of the school health program, the third with hygiene of the school program, the fourth with health supervision, the fifth with hygiene of environment, the sixth with hygiene instruction, the seventh with physical education for boys and the eighth with physical education for girls. Altogether it makes a lengthy questionnaire which would require a considerable study to execute satisfactorily. As with all appraisal instruments, its value is in direct proportion to the percentage of factual information as distinguished from opinions which it contains. Objectivity of self appraisal is difficult of achievement. This questionnaire seems for the most part to be about as objective as could be expected of a questionnaire on a subject involving so many variables and personal equations. In the last analysis, of course, the effectiveness of a program of health and physical education is not measured by equipment and curriculum but by such intangibles as qualifications of personnel, personality of instructors and resulting instructor-student relationships. Although the instructions state that this check list is not designed to be used as a questionnaire, it nevertheless has all the characteristics of such an instrument and will unquestionably be used as such in many instances.

School Health Problems. By Laurence B. Chenoweth, A.B., M.D., Professor of Hygiene, University of Cincinnati, and Theodore K. Selkirk, A.B., M.D., Instructor in Pediatrics, College of Medicine, University of Cincinnati, Cincinnati, Ohio. With a Chapter on School Health Administration. By Richard Arthur Bolt, M.D., Dr.P.H., Director, Cleveland Child Health Association, Cleveland. Second edition. Cloth. Price, $3. Pp. 419, with 115 illustrations. New York: F. S. Crofts & Co., 1940.

This book, in its fourth printing, deserves its wide circulation. It is a concise, adequate and comprehensive discussion of school health problems, dealing with history, the laws and factors involving growth in children, physical examination of children and its educational aspects, control of communicable diseases, light and vision, acoustics and hearing, special classes, tuberculosis in school children, mental hygiene, physical education, safety and accident problems, principles and school administration, sanitation and the teaching of health. The book gives scientific fundamentals on which various procedures are based and discusses with eminent objectivity and a due regard for all points of view the various problems which involve controversial or doubtful procedures. One need not necessarily agree with all the opinions of the authors to recognize that this book is based on a broad understanding of the subject, both from experience and from a wide familiarity with the literature. The book is so extensively documented that it would be valuable for its bibliography alone, if for nothing else. It should be of utmost value to school administrator, school nurse, classroom teacher, health supervisor, physical education personnel, school physicians, practicing physicians and members of school boards.

The Calcified Pineal Gland. By Dr. W. Bergmann. Paper. Pp. 89, with 15 illustrations. Assen: Van Gorcum & Comp. N. V., 1940.

This superficial, uncritical monograph is not worth critical consideration.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Liability for Excessive Reaction of Patient to Mercury Oxycyanide.—The plaintiff, who was afflicted with an incipient cataract of her right eye, and a friend, Mrs. Carver, who apparently had a similar affliction, on Sept. 9, 1937, went to the clinic operated by Drs. McLaughlin and Nauth. Dr. Walter, an eye specialist employed by the clinic, injected under the conjunctiva of the plaintiff's right eye 5 drops of a solution which had been prepared by the clinic's pharmacist, composed of 1 part of mercury oxycyanide in 10,000 parts of distilled water. He also injected some of the same solution into Mrs. Carver's eyes. The purpose of the injection was to set up an irritation to stimulate circulation in the eye and thereby arrest the cataract. An excessive reaction to the drug occurred in the plaintiff's right eye and a chronic inflammation of that eye resulted. Dr. Walter treated her for this condition until she went elsewhere for treatment. The plaintiff later sued all three physicians for malpractice and recovered a verdict in her favor. From the judgment of the trial court denying their motion for a judgment notwithstanding the verdict or for a new trial, the defendants appealed to the Supreme Court of Minnesota.

At the trial defendant Walker admitted that the reaction in the plaintiff's right eye was greater than anticipated or usual. He testified that he had made twenty injections into the eyes of different patients, using the same solution as he had injected into the plaintiff's eye, without any untoward results except as to the plaintiff, Mrs. Carver and a Mrs. Hays. However, the

excessive reactions in the plaintiff's and Mrs. Carver's eyes were not observed by him until seven days after the injections were made on September 9, and it was not shown whether he observed the excessive reaction in Mrs. Hays' eyes before or after that date. He further testified, and in this he was corroborated by medical experts called by both the plaintiff and the defendants, that injection of a 1:10,000 solution of mercury oxycyanide in the treatment of incipient cataract is good standard practice among eye specialists. The medical testimony also showed that injection of such a solution in a dosage up to 15 or 20 drops is considered safe. Three medical witnesses for the defendants, eye specialists, testified that the unexpected excessive reaction in the plaintiff's eye resulted either from some focal infection in her body or from her supersensitivity to the drug.

The fact that injection of the drug caused an excessive reaction or a bad result, said the Supreme Court, was not proof that either defendant Walker or the clinic's pharmacist was negligent. Common experience teaches that whether a drug is taken internally or is injected into the tissues or the blood stream the reaction is not the same in all persons even of the same age or apparently with the same condition, and the reaction varies greatly at times even as to the same person, depending on his physical or mental condition. Here the evidence was undisputed that "a dose of more than three times that used would be safe." There was no suggestion that defendant Walker's treatment after he discovered the excessive irritation was improper. Although the irritation or inflammation of the plaintiff's right eye did originate or start from the injection made by Dr. Walker, that fact did not prove or tend to prove negligence on his part. On the contrary, all the medical witnesses agreed that starting an irritation in the eye to stimulate circulation is the standard practice in the treatment of incipient cataract. What caused the inflammation to persist was unknown even to the medical experts. The plaintiff's only medical witness ventured no opinion that attributed the prolonged persistence of the irritation to any fault, lack of skill, or negligence on the part of any of the defendants. In the judgment of the court, the record in the case was barren of proof that the protracted irritation or inflammation of the plaintiff's right eye was due to the negligence of any of the defendants. The court concluded that the verdict in favor of the plaintiff was not sustained by the evidence because it was based on mere conjecture or guess. As the court did not believe this a proper case in which to order judgment notwithstanding the verdict, it reversed the judgment of the trial court with direction that a new trial be granted.—*Cassidy v. McLaughlin et al. (Minn.), 285 N. W. 889.*

Medical Practice Acts: Validity of Revocation Proceedings When Accused Physician Is Incarcerated Out of the State.—In the two decisions reported here the Supreme Court of Florida, in effect, ordered the state board of medical examiners of Florida to rescind and revoke orders previously entered by it at separate times revoking the licenses of two physicians, Weathers and Munch, to practice medicine. At the time of the revocation proceedings both physicians were incarcerated in the federal penitentiary at Atlanta, Ga., after conviction of felonies—Weathers, for a violation of the Harrison Narcotic Act and Munch for illegal use of the United States mails to defraud in selling bogus diplomas and licenses to practice medicine. Prior to holding the revocation proceedings in question notice of the hearings and copies of the charges preferred against each physician were duly served on each of them by registered mail. However, since the appropriate section of the Florida medical practice act in force at the time of each revocation proceeding conferred on the accused physician the right at the hearing to cross examine the witnesses against him, to produce witnesses in his defense and to appear personally or by counsel, the Supreme Court was of the opinion that the orders entered by the board were void as a denial of due process of law. The medical practice act, said the court, contemplates that a hearing on a revocation matter shall be held in the presence of the accused physician. While an accused physician may voluntarily waive that right he cannot be held to have waived it by his failure to appear when he is powerless to attend because of incarceration in prison, when that fact is known to the board, and when he does no affirmative act constituting a waiver. While the Supreme Court, in effect, restored to the two physicians their licenses to practice in Florida, it stated that nothing in its decisions nor in the prior revocation proceedings would preclude the board in the future from instituting "in a constitutional manner" proceedings looking toward the revocation of Weathers' and Munch's licenses for the commission of the very acts which formed the basis of their conviction in the federal court and for which they served time in the federal penitentiary.—*State ex rel. Weathers v. Davis et al. (Fla.), 196 So. 487; State ex rel. Munch v. Davis et al. (Fla.), 196 So. 491.*

Medical Services Necessities of Life.—In the opinion of the appellate department, superior court, Los Angeles County, Calif., medical services are necessities of life within the meaning of a California statute (Code of Civil Procedure, section 690.11), which provides that when a judgment is based on a necessary of life the judgment creditor may execute on up to one half of all wages earned by the judgment debtor.—*Medical Finance Ass'n v. Short (Calif.), 92 P. (2d) 961.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Cleveland, Oct. 6-11. Dr. William P. Wherry, 107 South 17th St., Omaha, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Excelsior Springs, Mo., Sept. 26-28. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Association of Railway Surgeons, Chicago, Sept. 16-18. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, White Sulphur Springs, W. Va., Oct. 28-30. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Chicago, Oct. 21-25. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Hospital Association, Boston, Sept. 16-20. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, Detroit, Oct. 8-11. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Roentgen Ray Society, Boston, Oct. 1-4. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.

American Society of Anesthetists, New York, Oct. 10. Dr. Paul M. Wood, 745 Fifth Avenue, New York, Secretary.

Association of Military Surgeons of the United States, Cleveland, Oct. 10-12. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Society for Clinical Research, Chicago, Nov. 1-2. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.

Clinical Orthopaedic Society, Milwaukee and Madison, Wis., Oct. 18-19. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Colorado State Medical Society, Glenwood Springs, Sept. 11-14. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.

Delaware, Medical Society of, Rehoboth Beach, Sept. 9-11. Dr. C. L. Munson, 1015 Washington St., Wilmington, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 15-17. Mr. Theodore Wiprud, 1718 M St., N.W., Washington, Secretary.

Idaho State Medical Association, Sun Valley, Sept. 11-14. Dr. J. N. Davis, 204 Fourth Ave., East, Twin Falls, Secretary.

Indiana State Medical Association, French Lick, Oct. 29-31. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 14-18. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Kentucky State Medical Association, Lexington, Sept. 16-19. Dr. A. T. McCormack, 620 South Third St., Louisville, Secretary.

Michigan State Medical Society, Detroit, Sept. 24-27. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Mississippi Valley Medical Society, Rock Island, Ill., Sept. 25-27. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Las Vegas, Oct. 11-12. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Pacific Association of Railway Surgeons, Reno, Nev., Sept. 20-21. Dr. W. T. Cummins, 1400 Fell St., San Francisco, Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Sept. 30-Oct. 3. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Minnesota Medical Association, Red Wing, Sept. 23. Dr. Harold C. Habein, 102 Second Ave., Rochester, Secretary.

Vermont State Medical Society, Rutland, Oct. 9-10. Dr. B. F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. J. G. Crownhart, 110 East Main St., Madison, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

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Vitamin Deficiencies in Practice. J. B. Youmans, Nashville, Tenn.—p. 1.

History of Ether Anesthesia: Its True Discoverer. S. A. Gordon, Marion.—p. 7.

The Government's Aid-to-the-Blind Program. B. F. Jackson, Montgomery.—p. 9.

Present Status of Fracture of Hip. W. C. Hannon, Mobile.—p. 10.

Vomiting in Early Infancy. H. Kennedy Jr., Birmingham.—p. 13.

American Journal of Clinical Pathology, Baltimore

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Clinical Pathologist. L. W. Larson, Bismarck, N. D.—p. 425.

*Incidence of Trichinosis Among County Hospital Patients in Detroit Area: Based on 500 Consecutive Autopsies. S. E. Gould, Eloise, Mich.—p. 431.

Unusual Spirochete Recovered from Blood in Arthritis. Thelma Wenzel, Nashville, Tenn.—p. 460.

Rheumatic Heart Disease: Analysis of 110 Cases. A. Levitt and S. J. Jaskiewicz, Buffalo.—p. 467.

*Sputum Studies in Pneumonia as Aid in Prognosis. A. W. Frisch, Detroit.—p. 472.

Tuberous Sclerosis with Cerebellar Involvement. A. F. Liber, New York.—p. 483.

Clinical Blood Cultures: Analysis of Over 5,000 Cases. H. Fox and J. S. Forrester, Philadelphia.—p. 493.

Incidence of Trichinosis in Detroit Area.—Gould investigated the incidence of trichinosis in 500 unselected consecutive necropsies of county hospital patients in the Detroit area and discovered ninety-three positive cases of infestation of Trichinella spiralis. The first ninety cases were examined by the digestion method only and eleven positive cases (12.2 per cent) were found. In the remaining 410 cases the pectoral muscle and diaphragm were examined by the microscopic press method and the Baermann digestion technic and eighty-two positive cases were found, an incidence of 20 per cent. If the diaphragm alone was available for examination, the highest percentage of positive observations would be obtained by a combined microscopic press examination of a specimen from the tendinous portion along with the examination of a liberal specimen by the digestion technic. An increasing frequency of infestation was found in successive decades from the fourth to the eighth inclusive. High incidences were found for the groups born in Austria, Hungary, Rumania or Bohemia. These were grouped together because it was believed that their food habits, particularly with reference to the preparation of pork products, were similar. In the group of foreign born patients it appeared likely that many had developed their infestation prior to their entrance into the United States. With advancing age there was an increase in the number of cases with calcified cysts. In cases positive on microscopic examination the diaphragms showed an average infestation 2.2 times as great as that of the pectoral muscle specimens. With the digestion technic only 22 per cent of the larvae estimated present in the diaphragm specimens and approximately 63 per cent of the larvae estimated present in the pectoral muscle specimens were recovered in the sediment. In six cases in which all of the digesting fluid was examined fractionally the total number of larvae recovered in each case approximated the number estimated to be present on the basis of the microscopic examination. In thirty-five cases in which Trichinella was recovered in the pectoral muscle or diaphragm the heart muscle was examined by the microscopic press and the digestion methods and in none of these cases was a single cyst or larva found. In none of the ninety-three patients with trichinosis was the disease recognized clinically. Three of the patients gave a history of "rheumatic" symptoms and at necropsy showed no lesion other than trichinosis. A fourth patient with a moderately severe infestation had a clinical diagnosis of alcoholic polyneuritis. It is likely that in the near future an increasing number of clinical and subclinical cases of trichinosis will be recognized during life.

Sputum Studies in Pneumonia as Aid in Prognosis.—In a preliminary report of seventy-eight roentgenographically proved cases of pneumonia a correlation was noted between multiple lobe involvement, decreased circulating leukocytes, incidence of blood stream invasion, mortality and the number of extracellular encapsulated pneumococci in rusty or bloody sputum. The present communication, based on 228 cases, is a continuation of the study. Frisch states that the microscopic examination of rusty sputum is a relatively quick and simple method of differentiating the severe from the mild pneumococcic pneumonias. There is a significant correlation between the number of pneumococci per field in the sputum and the incidence of bacteremia, leukopenia, multiple lobe involvement and the mortality rate. In a group of 181 patients, prognoses based on sputum counts have proved accurate enough to be applicable in individual cases. In addition, preliminary observations on necropsy material tend to support the concept that the number of pneumococci in rusty sputum is a reflection of the number present in some pneumonic areas of the lung. On the basis of these observations it may be possible to classify many cases of pneumonia on admission to the hospital into those requiring vigorous therapy and those which will respond to minimal treatment. Unfortunately some patients do not produce rusty sputum and are not suitable for study. The atypical behavior of type III pneumonia has been observed by numerous investigators. Type III pneumococci have the largest capsule and accordingly produce the greatest amount of specific soluble carbohydrate. The pneumonia induced by this organism is characterized by a predilection for the aged, a prolonged clinical course and a relatively low bacteremic incidence. The response to serum is often unsatisfactory and the mortality rate in bacteremic cases is unusually high. In sputum the type III pneumococcus differs from all others thus far observed in that the number of pneumococci per field does not appear to be closely related to the outcome of the pneumonia.

American Journal of Medical Sciences, Philadelphia

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Disappearance of Intravenously Injected Lymphocytes in Absence of Gastrointestinal Tract. L. A. Erf, Berkeley, Calif.—p. 1.

Antianemic Principle in Human Liver in Carcinomas of Stomach and Cecum. J. R. Schenken, J. Stasney and W. K. Hall, New Orleans.—p. 11.

*Follicular Lymphoblastoma (Giant Lymph Follicle Hyperplasia of Lymph Nodes and Spleen). A. H. Baggenstoss and F. J. Heck, Rochester, Minn.—p. 17.

Thrombosis of Axillary and Subclavian Veins, with Note on Post-Thrombotic Syndrome. J. R. Veal, Washington, D. C.—p. 27.

Myocardial Degeneration Associated with Uremia in Advanced Hypertensive Disease and Chronic Glomerular Nephritis. B. A. Gouley, Philadelphia.—p. 39.

Relationship of Migraine to Hypertension and to Hypertension Headaches. J. W. Gardner, G. E. Mountain and E. A. Hines Jr., Rochester, Minn.—p. 50.

Diabetic Control versus Caloric Sufficiency in Treatment of Diabetes and Pulmonary Tuberculosis. H. F. Root, Boston.—p. 53.

*Gastroscopic Findings in Patients with Duodenal Ulcer. T. Christiansen, Copenhagen, Denmark.—p. 61.

Inverted Duodenum, Its Clinical Significance with Report of Fourteen Cases. M. Feldman and T. H. Morrison, Baltimore.—p. 69.

Use of Sulfapyridine in Streptococcus Viridans Meningitis. W. J. Mitchell, A. G. Bower and P. M. Hamilton, Alhambra, Calif.—p. 75.

Sabin Agglutination Test as Control of Sulfapyridine Treatment of Pneumonia. W. W. Fox, R. Rosi and W. L. Winters, with technical assistance of Dolores Lammers, Chicago.—p. 78.

Control of Urine Reaction. M. A. Bridges and Marjorie R. Mattice, New York.—p. 84.

Effect of Nicotinic Acid on Peripheral Blood Flow in Man. D. I. Abramson, K. H. Katzenstein and Fanny A. Senior, Cincinnati.—p. 96.

Utilization of Vitamin A Added to Mineral Oil. A. C. Curtis and Priscilla B. Horton, Ann Arbor, Mich.—p. 102.

Follicular Lymphoblastoma.—According to Baggenstoss and Heck, a clinical and pathologic entity variously called "giant follicle hyperplasia of lymph nodes and spleen," "giant follicular lymphadenopathy" and "follicular lymphoblastoma" has been

described in the literature in recent years with increasing frequency. The authors review cases reported in the literature and present a clinical and pathologic study of thirteen cases seen at the Mayo Clinic. Seven of the latter died. In three cases necropsy was performed; in eight the lymph nodes and in two both lymph nodes and spleen were available for microscopic examination. Follicular lymphoblastoma is characterized by an insidious onset with regional or general lymphadenopathy, splenomegaly, absence of anemia or abnormal cells in the blood and by great radiosensitivity of the lesions. The average duration of life after the appearance of the disease is 4.5 years, but two patients have lived as long as seventeen years. The characteristic histologic changes occurring early in the disease consist of an increase in the number and size of the follicles of the lymph nodes and of the malpighian corpuscles of the spleen. There is a tendency toward fusion of the follicles, and the lymphatic sinuses are generally narrowed or obliterated. There is a superficial resemblance between the microscopic appearance of follicular lymphoblastoma and the microscopic appearance of hypertrophy of the secondary centers of lymph nodes resulting from toxic or inflammatory conditions. The histologic criteria which enable the histopathologist to distinguish the two conditions are outlined in a table. In certain rare instances in which the microscopic appearance is not typical of either follicular lymphoblastoma or inflammation it may be wise to reserve diagnosis and to use a descriptive, noncommittal term, such as "follicular hypertrophy." Subsequent observation and biopsy frequently will bear out the suspicion that the condition is an early instance of follicular lymphoblastoma.

Gastroscopic Observations in Duodenal Ulcer.—Christiansen stresses the disagreement between the gastroscopic and the pathologic-anatomic concepts of the pathogenesis of peptic ulcer. Konjetzny maintains that chronic ulcer is the end product of a primary chronic gastroduodenitis which passes through the catarrhal and the erosive stage, reaching its climax in the ulcerative stage with the formation of one or more chronic ulcers. In contrast to this view, Schindler and other gastroscopists consider chronic peptic ulcer and gastritis as two different lesions without causal connection. Gastroscopy in most cases of chronic ulcer does not reveal gastritis. Gastritic alterations which may appear in cases in which the ulcer gives rise to retention of stomach contents are secondary and curable. Ulcerations may appear in primary gastritis but they do not develop into chronic ulcers, since they are acute and transitory phenomena. Christiansen found seventy cases of roentgenologically verified duodenal ulcer among more than 500 patients with organic lesions of the digestive tract. In none of these was it practicable to ascertain by relief examination changes in the stomach. The patients were examined gastroscopically at a time when they had pronounced dyspeptic symptoms and prior to the institution of treatment. Most of them were submitted to gastroscopic examination several times. He found that, regardless of the secretory conditions, gastroscopy demonstrated definite changes in the mucous membrane in forty-nine of the seventy cases (70 per cent) while the gastroscopic aspects were normal in twenty-one (30 per cent). Thus, in contrast to Schindler's opinion, the gastroscopic examination revealed that the stomach in the majority of the cases was the site of pronounced pathologic alterations. The frequency of gastritis in duodenal ulcer cannot, however, be taken to confirm the observations of Konjetzny, as there is a considerable difference between the changes observed and those found in resected specimens. The author reviews a case history which furnishes an explanation of the divergence between Konjetzny and Schindler. If resection had been performed on a patient when his illness was at its worst, the specimen would have presented the picture on which Konjetzny based his theory. There would have been a duodenal ulcer associated with a violent, erosive, antral gastritis. The course of the disease showed, however, that these pronounced changes were of an acute character, healing within a few weeks when the pyloric spasm subsided and the retention disappeared. Improvement of clinical symptoms ran parallel with rapid healing of severe gastric changes, while the roentgenographic changes in the duodenum remained constant. This may be interpreted as indicating that the particular duodenal ulcer is the primary lesion while gastritis is secondary. The author thinks that, as a general rule, patients with a nonstenotic duodenal ulcer are liable to pathologic changes in the gastric mucosa even though no abnormality may be demonstrated by roentgenography or the Ewald test meal. Gastroscopy is the method of examination capable of settling this question. The gastritis may be total or partial. The erosions are acute manifestations which may heal in a few days, regardless of whether the gastritis improves at the same time. Transition to a chronic gastric ulcer has not been observed. The typical ulcer symptoms seem to appear in cases in which the stomach is affected. Acute gastric retention may be associated with severe erosive changes in the stomach. These changes are inconstant and may disappear rapidly when the retention subsides. Probably this condition does not involve a primary gastritis, as has been claimed by Konjetzny, but more likely secondary peptic injury, as asserted by Schindler.

American Journal of Orthopsychiatry, Menasha, Wis.

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Psychotherapeutic Problems of Puberty. F. J. Curran, New York.—p. 510.
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Personality and Efficiency of Mental Functioning. Harriet Babcock, New York.—p. 527.
Body-Mind Unity. I. S. Wile, New York.—p. 532.
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Foster Home and Group Placement. Julia Deming, Boston.—p. 586.

American Journal of Physiology, Baltimore

130:1-230 (July) 1940. **Partial Index**

Vasoconstriction in Renal Hypertension Abolished by Pithing. W. Dock, with assistance of B. Moy, San Francisco.—p. 1.
*Variability of Blood Hydrogen Ion Concentration and Its Association with Meteorologic Factors. M. Berg, A. Mayne and W. F. Petersen, Chicago.—p. 9.
Demonstration of Liberation of Renin into Blood Stream from Kidneys of Animals Made Hypertensive by Cellophane Perinephritis. I. H. Page, Indianapolis.—p. 22.
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Some Features of Early Stages of Neuromuscular Transmission. A. Rosenblueth and W. B. Cannon, Boston.—p. 205.
Some Conditions Affecting Late Stages of Neuromuscular Transmission. W. B. Cannon and A. Rosenblueth, Boston.—p. 219.

Variability of Blood p_H and Meteorologic Factors.—Berg and his associates studied the variations in the blood p_H during one year in a group of "normal" dogs and compared them with similar determinations made on human beings. They found a high statistical correlation in comparing the continuous p_H values in dogs with those of human beings. A relatively wide degree of fluctuation was observed in both. In man the weekly averages varied from 7.28 to 7.68, while in dogs they varied from 7.32 to 7.68. In comparing the blood p_H and the weather, statistically significant coefficients were found with barometric pressure and temperature, with a distinctly higher correlation for barometric pressure than for temperature. Increases in p_H were associated with increases in barometric pressure. However, the relationship between p_H and tempera-

ture was not as marked and only at higher temperatures were increases in p_H definitely associated with increases in temperature. Varying results were found in attempting to evaluate seasonal influences. Failure to duplicate seasonal results is logical, for one spring may not be like another spring and one May not like another May. The temperature may be low and the barometric pressure high, or they may be unstable one year and more stable the next. One cannot compare corresponding months of different years and consider them similar only because of their order in time. On such a basis failures to duplicate results cannot be considered as discounting climatic influence.

American Journal of Public Health, New York

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Development of Medical Care Plans for Low Income Farm Families: Three Years' Experience. R. C. Williams, Washington, D. C.—p. 725.
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Mortality in Children of Tuberculous Households. Miriam Brailey, Baltimore.—p. 816.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

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Effect of Early Subcurative Arsenical and Thermal Treatment on Development of Specific Immunity in Syphilitic Rabbits. I. L. Schamberg, Baltimore.—p. 401.
Studies in Bismuth Therapy of Syphilis: II. Therapeutic Activity of Bismuth in Syphilis of Rabbits in Relation to Its Urinary Excretion. J. A. Kolmer, H. Brown and Anna M. Rule, Philadelphia.—p. 415.
Id.: III. Spirocheticidal, Trypanocidal and Mechanism of Activity of Bismuth Compounds in Vitro and in Vivo in Relation to Therapeutic Effectiveness. J. A. Kolmer, Clara C. Kast and Anna M. Rule, Philadelphia.—p. 439.
*Observations on Thirty-Five Cases of Venereal Lymphogranuloma Treated with Sulfanilamide. R. O. Stein, Philadelphia.—p. 454.
Protective Value of Bismuth in Syphilis: Experimental Results with Drinking of Sobisminol. P. J. Hanzlik, A. J. Lehman and W. Van Winkle Jr., San Francisco.—p. 468.
Chancroid. M. Sullivan, Baltimore.—p. 482.

Sulfanilamide for Venereal Lymphogranuloma.—Stein used sulfanilamide in the treatment of thirty-five cases of the bubonic type of venereal lymphogranuloma. The duration of the disease in thirty-two cases varied from two days to three months, and in one each it was one, two and three years respectively. All the acute cases cleared up clinically with the same relative speed, but in the cases of longer duration in which fibrosis had occurred the course was different. The dosage of sulfanilamide varied from 4 to 5.3 Gm. divided into four daily doses. Most of the patients were not hospitalized but returned to the clinic three times a week. The amount of the drug given was carefully calculated to last until the next clinic visit. Patients were not informed as to the nature of the medication; thus if the patient experienced toxic symptoms but did not return, no great harm could have occurred. Few toxic effects were encountered. About 50 per cent of the patients complained of headache, dizziness or other minor symptoms. In no case was it considered necessary to stop medication. Of the thirty-five patients treated, the results of three are unknown. The remaining patients were cured, with complete subsidence of the local lesions and relief of all constitutional symptoms. In from two to ten days the patients felt better and had no further pain. In from five days to four and one half weeks all the lesions had healed, excluding the two cases with draining sinuses, which required about three months of treatment. Two patients with elephantiasis improved within two weeks. Of twenty-two patients treated between six and eight months ago twenty could be followed up and nineteen are clinically well today. All constitutional symptoms have disappeared. The twentieth patient took sulfanilamide for only two days. Subsequently the gland enlarged and ruptured. A draining sinus was established, and the patient was confined to bed for about ten days. Finally the lesion healed. It seems necessary to continue therapy for from seven to ten days after the lesions have completely subsided. In the ordinary case this amounts to about four weeks of treatment with 4 Gm. a day, three weeks with 5.3 Gm. a day or two weeks with 6.6 Gm. a day.

Archives of Surgery, Chicago

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*Some Etiologic and Pathologic Factors in Cancer of Large Bowel. V. C. David, Chicago.—p. 257.
Barberry: Ancient Remedy; New Germicide. G. F. Dick, Chicago.—p. 287.
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Solitary Nonparasitic Cysts of Liver in Children. A. H. Montgomery, Chicago.—p. 422.
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Microscopic Changes Induced in Thyroid Gland by Oral Administration of Desiccated Thyroid: Use of Substance in Treatment of Congenital and Simple Colloid Goiter. W. F. Rienhoff Jr., Baltimore.—p. 487.
Surgical Problems in Treatment of Chronic Ulcerative Colitis. H. B. Stone, Baltimore.—p. 525.
Ludwig's Angina. H. H. Trout, Roanoke, Va.—p. 532.
Cardial Gastric Ulcers: Results of Operation for Apparently Inaccessible Lesions. W. Walters, Rochester, Minn.—p. 542.
Subdeltoid Bursitis. A. Weeks, San Francisco.—p. 554.
Operative Treatment of True Hermaphroditism: New Technic for Curing Hypospadias. H. H. Young, Baltimore.—p. 557.

Etiologic and Pathologic Factors in Intestinal Cancer.—David calls attention to the frequency of supposedly benign polypoid growths of the large intestine and their relation to cancer. His studies comprised 200 resected cancers and 100 specimens of supposedly benign polyps of the colon and rectum. One of the most common alterations in the mucosa of the colon is the occurrence of millet seed-sized flat elevations, which are usually multiple and occur mostly in old persons. The histologic structure of these lesions is one of simple hyperplasia with inflammation or lymphatic hyperplasia of the submucosa. In exceptional instances the lesion may resemble larger polyps, which are almost certainly tumors rather than simple hyperplasia. The next most frequently seen type of polyp is the adenomatous polyp. It varies in size from that of a pea to that of a large cherry and may be transparent or of the same color as the mucosa. It has the indications of being a benign lesion. Other polyps of this adenomatous group present evidence of a growth or tumor change in their epithelium; their color is plum or cherry. They may become large, with a cauliflower surface, and contain branching stalks of connective tissue. In this type of adenoma the mucosa has taken on real growth propensities; it is a benign tumor. Another gross division of benign polypoid tumors is that of papilloma or villous tumors. The tendency to wild, disorganized tissue growth is found in these tumors, and in two of twenty-seven cases the author has seen an early carcinoma beginning in the lesion. One of the most convincing arguments in favor of the relation of polyps of the large bowel

to the development of carcinoma is seen in multiple polyposis, in which the entire colon and rectum may be studded. The etiologic basis here is a hereditary one. They have a tendency to malignant degeneration. Akin to this lesion, but lacking the hereditary factor and the extensive involvement, is the occurrence of multiple polyps. It seems probable that the malignant degeneration of these polyps is responsible for the increasing recognition of multiple cancers of the large intestine. The author observed five double cancers of the large intestine, in four of which the condition was highly suggestive of carcinomatous degeneration of polyps. Of less importance are the so-called lymphoid polyps, which may appear as multiple slightly elevated flat lesions a few millimeters in diameter, affecting the colon and rectum, and really a form of lymphoid hyperplasia. Of more clinical interest but lacking carcinomatous tendencies are the large lymph polyps, of which the author has seen five instances in the rectum. The last classification is the inflammatory type. The elevations and tumor-like growths on the mucosa of a patient with this type of polyp ranged from simple hyperplasia to typical adenoma formation. The author concludes that there is a gross and gradual histologic transition in the mucosa of the large bowel from hyperplasia to adenoma or from papilloma to carcinoma. Whether the tendency to carcinoma is present from the start is not known. Carcinomatous changes can be diagnosed only by gross evidence of induration or ulceration and by microscopic evidence of invasion. While many of the polyps of the colon remain benign for years, they cannot be trusted to do so and should be thoroughly removed, locally if benign, and radically if malignant. The results of biopsy are not conclusive unless the material is taken from an area of ulceration or induration. It is frequently impossible to make a diagnosis of malignancy from a small piece of tissue. It is better to examine the whole tumor. The earliest carcinomas the author has seen in the large intestine were 1 to 2 mm. ulcerating lesions found on polyps.

Intrathecal Administration of Tetanus Antitoxin.—Firor records experiments which show that the intracisternal injection of antitoxin into dogs suffering from early mild or moderately severe tetanus yields far better results than intravenous injection. The experiments in themselves do not warrant the use of intracisternal injections for patients, but when considered with the clinical reports of Yodh or Vener they furnish a strong argument for the employment of this form of treatment. It is highly desirable that a more refined antitetanic serum be produced in order to minimize the severe reactions described by Dietrich. This may be accomplished in one of two ways. First, ordinary antitetanic horse serum may be concentrated and purified by the action of proteolytic enzymes, as has been done with diphtheria antitoxin. Secondly, human serum containing a high titer of tetanus antitoxin may be produced by active immunization of human donors with tetanus toxoid. This possibility was first suggested by Hyland of Los Angeles. The reported experiments comparing the efficacy of intracisternal and lumbar routes are suggestive but not conclusive. Had the animals been kept in a position to cause a gravitational flow of the serum to the medulla, the apparent difference in results with the two sites of injection might have disappeared. Similarly, the author does not consider that his experiment, which was designed to evaluate the importance of the inflammatory reaction to foreign serum in the meninges, is conclusive. Additional studies with purified serum on a larger number of animals are necessary before this question can be settled.

Gas Gangrene: Wool as Source of Contamination.—Maes observed that contamination with woolen clothing is a common source of infection in cases of gas gangrene. At his suggestion Gage had studied samples of clean wool and was able to grow spore-bearing organisms in practically all instances. Given a favorable type of wound (muscle injury) and contamination with wool clothing, the ideal conditions exist for the development of gas bacillus infection. With the assistance of Williams, Maes analyzed the seventy-three cases of gas gangrene observed at the Charity Hospital of New Orleans during the ten year period from 1930 to 1939. He investigated the seasonal incidence because he believed that the wool clothing worn in the cooler months is an important source of contamination. He found that there was a higher incidence during the cool months. Schenken made cultures of sample of new wool and found gram-positive spore-bearing anaerobic gas-forming bacilli, morphologically compatible with the members of the Clostridium group in eleven out of twelve samples. Dry cleaning and steam pressing did not materially alter the incidence of the organism. Gas bacilli were not found in any of the twelve samples of the material which did not contain wool. This confirms the fact that contamination with clean wool in certain types of wounds should be considered a precursor of gas gangrene. The author observed two instances in which gas bacillus infection followed hypodermic injections. In each of these instances wool blankets had been in contact with the skin or with a raw surface. Thus contamination with any woolen article, even clean clothing, makes rigid prophylactic measures imperative. It is urged that physicians suspect anaerobic infection with production of gas gangrene whenever wounds of the extremities involving muscle have been contaminated with wool or with soil. Such wounds should be treated by wide incision or by thorough débridement. Prophylactic administration of the specific serum seems to be of value, and from the report of Keating and Davis the prophylactic use of roentgen therapy is justified. In the presence of suggestive signs of such infection, specific treatment should be started at once. Since there is some benefit from the anti-gas bacillus serum and from sulfanilamide and since there is positive evidence of benefit from the use of the roentgen rays, all three should be used. Wide incision and amputation still have their place and must be used when conditions warrant.

California and Western Medicine, San Francisco

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Frontiers of Medicine Still Lie Ahead. C. A. Dukes, Oakland.—p. 254.
Endocrinology: A Critical Appraisal. E. H. Rynearson, Rochester, Minn.—p. 257.

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Biologic Engineers. R. L. Wilbur, Stanford University.—p. 8.
Some Aspects of Nutrition in Surgical Patients. I. S. Ravdin, Philadelphia.—p. 10.
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Present Status of Immunization Against Pertussis. J. J. Miller Jr., San Francisco.—p. 25.
Syphilis: Comments on Its History. H. S. Campbell, Los Angeles.—p. 28.

Journal of Pharmacology & Exper. Therap., Baltimore

69:177-271 (July) 1940. **Partial Index**

Studies on Purified Digitalis Glucosides: I. Potency and Dosage of "Digitaline Nativelle" by Oral Administration in Man. H. Gold, N. T. Kwit and M. Cattell, New York.—p. 177.
Mode of Action of Veritol. H. Kwiatkowski, London, England.—p. 198.
Anesthesia: I. Anesthetic Action of Cyclopropyl Methyl Ether. J. C. Krantz Jr., C. J. Carr, S. E. Forman and W. E. Evans Jr., Baltimore.—p. 207.
Effect of Sodium Salt of 1,5 Diphenylpyrazoline-3-Carboxylic Acid on Body Temperature of Normal Albino Rats at Different Environmental Temperatures. F. H. Schultz and R. M. Hill, Denver.—p. 221.
Anesthetic Activity of Optical Antipodes: I. Secondary Butyl Alcohols. T. C. Butler and H. L. Dickison, Nashville, Tenn.—p. 225.
Metabolic Fate of 1-Methyl-5-Allyl-5-Isopropyl Barbituric Acid (Narconumal). T. C. Butler and M. T. Bush, Nashville, Tenn.—p. 236.
Free and Bound Morphine in Urine of Morphine Addicts. F. W. Oberst, Lexington, Ky.—p. 240.
Studies on Absorption, Distribution and Elimination of Alcohol: VI. Principles Governing Concentration of Alcohol in Blood and Concentration Causing Respiratory Failure. H. W. Haggard, L. A. Greenberg and N. Rakieten, New Haven, Conn.—p. 252.

Kansas Medical Society Journal, Topeka

41:277-320 (July) 1940

Epilepsy. M. G. Peterman, Milwaukee.—p. 277.
Modern Trends in Anesthesia. L. H. Mousel, Rochester, Minn.—p. 279.
Acute Obstruction of Ureter. O. R. Clark, Topeka.—p. 282.
The Appendix and What to Do with It. C. Wilson, Emporia.—p. 287.
Lobar Pneumonia Complicated by Diabetes Treated with Sulfapyridine: Report of Case. C. B. Johnson, Eudora.—p. 289.
Lymphogranuloma Inguinale: Treatment with Sulfanilamide; Case Report. M. Bernreiter, Kansas City.—p. 290.

New England Journal of Medicine, Boston

223:85-118 (July 18) 1940

Cysto-Urethrograms: Roentgen Visualization of Urethra, Bladder and Prostate. F. H. Colby and H. I. Suby, Boston.—p. 85.
*Vitamin A Requirements in Rheumatoid Arthritis. M. G. Hall, Milton, Mass.; T. B. Bayles and Phyllis Soutter, Boston.—p. 92.
Carcinoma of Ampulla of Vater: Report of Three Year Cure. L. Hyde and E. L. Young, Boston.—p. 96.
Bacteriology. C. A. Janeway, Boston.—p. 100.

223:119-164 (July 25) 1940

Physical Growth, Degree of Intelligence and Personality Adjustment of Group of Diabetic Children. Agnes P. McGavin, Ethel Schultz, Gwendolyn W. Peden and B. D. Bowen, Buffalo.—p. 119.
Irrigation and Tidal Drainage. A. E. MacNeill and J. P. Bowler, Hanover, N. H.—p. 128.
Kidney Disease. R. Fitz, Boston.—p. 142.

Vitamin A in Rheumatoid Arthritis.—Hall and his associates compared the distribution of vitamin A values among seventy-nine patients with rheumatoid arthritis with those of thirteen normal individuals on a similar dietary regimen. Information was sought as to the daily requirement of vitamin A and the effect, if any, on the course of the disease when this requirement was fulfilled. The average initial biophotometer reading of the seventy-nine patients was 0.78 and that of the controls 0.32 millifoot candle. Twenty-eight patients had initial readings at or below the normal limit of 0.5 millifoot candle, and twenty-eight had initial readings between 0.5 and 1 millifoot candle and were considered borderline or subnormal. The reading of seventeen fell between 1 and 1.5 millifoot candles. This was considered to indicate moderate vitamin A deficiency. The remaining six patients had initial readings greater than 1.5 millifoot candles and were considered severely deficient in vitamin A. The older age groups had more abnormal initial biophotometer readings. However, when the dark adaptation values of arthritic patients between the ages of 20 and 29 are compared with those of controls of the same age, they are seen to be definitely abnormal. The 30 per cent of the patients who were moderately or severely deficient showed no obvious clinical manifestations of vitamin A deficiency, xerophthalmia or keratomalacia. Night blindness was noticed by only one of the patients. During the test, several patients complained of nyctalopia. The provision of adequate vitamin A therapy effected no clinically observable favorable result in the rheumatoid patients, but it would seem desirable to eliminate an existing deficiency of this vitamin as a general supportive measure. In rheumatoid arthritis, as in other chronic or infectious diseases, there is an increased demand for vitamin A as measured by the dark adaptation curve. Many arthritic patients require from four to ten times the amount of vitamin A present in their regular diet to maintain normal dark adaptation curves. At present it is not known whether this increased need represents an increased utilization, decreased absorption or an inactivation of the vitamin.

Public Health Reports, Washington, D. C.

55:1295-1325 (July 19) 1940

Geographic Distribution of Disease: III. Decade of Poliomyelitis in Louisiana. A. E. Casey and B. J. Aymond.—p. 1295.
Natural Infection of Triatoma Heidemanni with Trypanosoma Cruzi in Texas. A. Packchanian.—p. 1300.
*Isolation and Pathogenicity of Pityrosporum Ovale. C. W. Emmons.—p. 1306.
*Chigger Mites.—p. 1312.

Isolation of Micro-Organism in Dandruff.—According to Emmons, a small yeastlike micro-organism is almost always associated with the dry or greasy scales of seborrhea capitis or dandruff. It can be found on the majority of "normal" scalps and is present on other skin surfaces. This micro-organism is known as the "bottle bacillus" and Pityrosporum ovale. Although observers agree that Pityrosporum ovale is usually found associated with seborrhea, they do not agree on its cultural characteristics or its etiologic significance. Many investigators have tried in vain to isolate this fungus. In most cases when Pityrosporum ovale has been isolated, assuming that the micro-organism obtained was correctly identified, the isolations were largely fortuitous, most attempted cultures yielding no growth or only contaminants. The author reports a method of isolating Pityrosporum ovale which is dependable. Pityrosporum ovale was repeatedly and easily isolated by planting scales from seborrhea oleosa in acid dextrose broth containing from 23 to 44 per cent glycerin and incubating at from 30 to 37 C. Subcultures were successfully carried on mediums prepared by pipetting off ether extract of hydrous wool fat, oleic acid or seborrheic scales over agar slants, as described by Benham. Evidence that the organism was actually Pityrosporum ovale was furnished by the necessity for using special mediums, the resemblance of the fungus in culture and in the skin, and a series of observations of the inoculum which showed a continuity of development of the cells of Pityrosporum ovale in the scales. Attempts were made to determine whether Pityrosporum ovale is pathogenic. Instead of trying to find and experimentally infect an individual who did not already carry the fungus, it was decided to inoculate a seborrheic individual and to measure any noticeable increase in the time required to develop seborrhea in the area inoculated as compared with an uninoculated area. Lesions of seborrhea did not appear any sooner in the inoculated areas than in the control areas. These experiments were repeated, but no pathogenic properties of the fungus could be demonstrated. Although some features of seborrhea seem consistent with a parasitic etiology, the failure of these inoculations would give support to the contention of many dermatologists and myocologists that Pityrosporum ovale is a saprophyte especially adapted to growth on the skin but without etiologic significance in seborrhea.

Chigger Mites.—Chiggers have a widespread distribution in the United States. They have been found in low lands and well up in the mountains wherever there is a rough growth of weeds and shrubbery. They may be encountered from the latter part of April until the last of October, depending on conditions of temperature and moisture. Chiggers attach themselves to the surface of the skin by means of their mouthparts and feed much as do ticks. They apparently feed on epidermal tissue liquefied by a secretion which they themselves inject into the skin. When they become fully engorged they drop off. The localization of chigger attachment is determined by two factors, the tightness of the clothing at certain parts of the body and the thickness of the skin. Experiments have shown that chiggers attack by preference where the skin is very thin and the flesh wrinkled or tender. Because of their size, 150 microns in width before they have become engorged, chiggers are unable to enter the pores of the skin (which range from 20 to 50 microns in diameter), but they frequently attach themselves at the mouth of hair follicles. Although it is widely believed that chiggers burrow into the skin and embed their entire body, this method of attack must be extremely uncommon. An intense itching develops within the first twenty-four hours after exposure, and this is followed by a breaking out of wheals or papules surrounded by an inflamed area. If the lesions are numerous, fever, headache and temporary nervous upset may result. If there has been exposure to chiggers, an application of kerosene or 95 per cent alcohol will kill the larvae. As soon as possible after exposure, a thick lather of soap should be applied to the affected parts and allowed to remain for ten minutes or more before bathing. Even though the larvae may be removed or killed soon after attachment, usually enough secretion has been introduced to cause the characteristic itching lesion, which may be temporarily relieved by ammonia or strong salt water, or a mild mercurous chloride-phenol lotion. Collodion with metaphen applied to the lesions is recommended both to relieve the itching and to prevent infection. An efficacious measure to prevent attack by chiggers is the liberal sprinkling of the stockings and underclothing with sublimed sulfur. Some authors state that spraying of the shoes, stockings and trouser legs with one of the proprietary fly-repellant preparations is successful in warding off attacks by chiggers.

Tennessee State Medical Assn. Journal, Nashville

33:243-288 (July) 1940

Analysis of Mortality in Acute Appendicitis and Appendical Peritonitis. J. P. Baird, Dyersburg.—p. 243.
A New and Original Drainage Tube. E. T. Newell, Chattanooga.—p. 250.
Planned Economies and the Medical Profession. J. H. Pew.—p. 255.
Chronic Trigonitis: Its Effect on Trigonal Epithelium. H. L. Douglass, Nashville.—p. 261.
Treatment of Carcinoma of the Lip. G. S. Johnson, Nashville.—p. 268.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

63:123-204 (June) 1940

Gower's Tract and Spinal Border Cells. Sybil Cooper and C. S. Sherrington.—p. 123.
Experimental Study of Role of Neurons in Dissemination of Poliomyelitis Virus in Nervous System. D. Bodian and H. A. Howe.—p. 135.
*Relationship Between Amyotonia Congenita and Congenital Myopathy. J. W. A. Turner.—p. 163.
Tolerance of Blocked Galenic System Against Artificially Increased Intravenous Pressure. B. Schlesinger.—p. 178.
Intracranial Hydatids. C. Langmaid and L. Rogers.—p. 184.
Study of Cortical Metabolism in Relation to Cerebral Disease. K. C. Dixon.—p. 191.

Amyotonia Congenita and Congenital Myopathy.—Turner believes that the relationship between congenital amyotonia and the myopathies has been somewhat clarified by the study of a family which has been under observation at the National Hospital for a number of years. The family consists of thirteen children, six of whom have been affected by the disease. Neither parent was affected. The clinical picture presented by the children in early infancy was typical of congenital amyotonia as described by Oppenheim, from the observations that fetal movements were feeble and appeared late. From the limpness and small size of the children at birth and during the first few weeks of life, it seems probable that the disease was present before birth. The abnormality of fetal movements has been described previously. In early adult life the clinical picture presented by the same patients was equally typical of a myopathy of somewhat unusual distribution, and the course of the disease shows that there was a gradual transition from the state of amyotonia with its marked flaccidity and absence of local muscular atrophy to the state of myopathy with considerable local muscular atrophy and absence of flaccidity. There can be little doubt that the patients were suffering from one disease process, a myopathy, and from this the author concludes that they were affected by a congenital myopathy, which in its early stages had produced the clinical picture of congenital amyotonia. The clinical picture of congenital amyotonia may be produced by a congenital myopathy or by a spinal disorder which is related to the Werdnig-Hoffmann disease.

British Medical Journal, London

2:1-38 (July 6) 1940

*Reactions from Transfusion of Preserved Blood: Experience with 1,600 Transfusions. E. L. DeGowin and R. C. Hardin.—p. 1.
Prevention of Acute Failure of Circulation Following Injuries to Large Arteries: Experiments with Glass Cannulas Kept Patent by Administration of Heparin. G. Murray and J. M. Janes.—p. 6.
Leprosy Cases in the British Isles. L. Rogers, J. H. Cook and E. Muir.—p. 7.
*Chemotherapy of Gonococcic Infections in Women and Children. Mary Moffett.—p. 8.
*Tuberculosis of Knee: Follow-Up Investigation of Old Cases. R. C. Murray.—p. 10.

Reactions from Transfusion of Preserved Blood.—DeGowin and Hardin report on the 1,604 blood transfusions supervised by the staff of the blood transfusion laboratory from Oct. 11, 1938, until Jan. 19, 1940. The amount of blood transfused varied from 50 cc. for infants to 500 cc. for adults. The total volume of fluid for 500 cc. of citrated blood was 600 cc. The dextrose-citrate mixture (a modification of the Rous and Turner mixture) constituted a total volume of 1,250 cc. when 500 cc. of blood was used. Many recipients received more than one transfusion. The indications for transfusion were chiefly anemia, serum protein deficiency, infections and shock. In 146 instances the blood was administered within two hours after its collection, considered fresh blood transfusions. The other 1,458 transfusions were done with blood from one to thirty-eight days old. Reactions distinctive of preserved blood were not encountered. The incidence of the various types of reaction did not increase or decrease with the period of storage of the blood mixtures. A limit of ten days of storage at from 3 to 5 C. was found to be safe for citrated blood. Blood stored in the dextrose-citrate mixture was found to be safe for transfusion after thirty days of storage. A comparison of the incidence of pyrogenic reactions in 951 blood transfusions with that of 7,181 parenteral injections of saline or dextrose solution showed that about 3 per cent of the febrile reactions from the blood transfusions could not be attributed to pyrogens in the apparatus or fluids used. This comparison did not exclude the possibility of the introduction of pyrogenic organisms at the time of the collection of the blood. The presence of pyrogens should be suspected when the incidence of febrile reactions is high. There were two deaths from transfusions—one from incompatible blood and one from cardiac embarrassment. Neither of these could be attributed to the use of preserved blood in contradistinction to fresh blood.

Chemotherapy of Gonorrhea in Women and Children.—Moffett observed the efficacy of sulfapyridine in 104 cases of gonorrhea in women, twenty cases of gonococcic vulvovaginitis in inpatient children and twenty cases of gonococcic ophthalmia in inpatient infants. Of the 104 cases, forty were acute, twenty-seven subacute and thirty-seven chronic. Most of the patients were from 20 to 35 years of age. The method giving the best results was the administration of one tablet (0.5 Gm.) of sulfapyridine four times a day after food for one week. This was begun as soon as the diagnosis of gonorrhea was made. In addition, local treatment (the application of 10 per cent strong protein silver to the urethra and cervix) was carried out. This was given until the onset of the menstrual period following cessation of the drug, and thereafter once or twice weekly for another month. For the next four weeks the patients were examined once a week and local treatment was applied only if discharge or congestion persisted. Patients did not complain unduly of any ill effects. The criteria for cure required that all smears from the urethra and cervix for three months following the week of drug treatment should be negative. Nine women defaulted before observation had been completed, but of the remaining ninety-five 87.4 per cent, or eighty-three, fulfilling these requirements were cured. A study of these twelve unsatisfactory results showed that (1) inadequate dosage due to intolerance or faulty attendance for treatment was responsible for the failure to cure in four cases, (2) relapse occurred after local treatment had been missed for several weeks in one case, (3) there was no response to the drug in three cases and (4) after being negative during the administration of the drug and remaining satisfactory for varying lengths of time the gonococcus reappeared in spite of local treatment in four cases. Gonococcic complications cleared up without any treatment other than the administration of the drug. The dosage of sulfapyridine for the children with vulvovaginitis varied from a fourth of a tablet four times a day for one week in infants less than 3 months of age to half a tablet six times a day for one week in older girls. This was accompanied first by daily and then weekly vaginal swabbing with 10 per cent strong protein silver and the application of bismuth subgallate. The average duration of local treatment was four months, the limits being three and nine months. Only eleven cases were classified as satisfactorily cured. Further treatment of the cases not cured suggests the advisability of giving as a routine in all cases of gonococcic vulvovaginitis two courses of sulfapyridine separated by an interval of from ten to fourteen days. For the twenty cases of gonococcic ophthalmia the routine adopted was one-fourth tablet of sulfapyridine four times a day given with sodium bicarbonate, supplemented by irrigation with physiologic solution of sodium chloride, the frequency depending on the severity of the case. Smears from all the cases were negative within four days, even in two which had failed to respond to local treatment and protein shock. There were no relapses. The drug was discontinued forty-eight hours after the smears became negative. A total dosage of 3 Gm. sufficed in every case. The sulfapyridine was given crushed in milk to which a pinch of sodium bicarbonate was added. It caused no signs of intolerance.

Tuberculosis of Knee.—Murray reports the follow-up of 110 cases of tuberculosis traced from five to fifty-six years, average thirteen years, after the onset of the disease. In thirty-three cases of the synovial type there has been one death of pulmonary tuberculosis. In only one is the disease still active (five years after the onset), while in the others the disease is regarded as cured or quiescent. In ten there is a full range of movement and the joint is functionally normal, in eight limited painless movement varies from 20 to 100 degrees and in six

unsound ankylosis is present. Seven cases required arthrodesis; six resulted in bony ankylosis, the seventh in nonunion. Alteration in growth of limbs affected by synovial tuberculosis was observed in fifteen cases in the absence of focal bone changes; lengthening occurred twice as often as shortening. In seventy cases of the focal articular type there have been fifteen deaths. Eleven of these deaths were due to other tuberculous lesions, pulmonary and miliary tuberculosis and meningitis. In nearly all these cases, together with seven patients still alive in whom other tuberculous lesions developed, the primary tuberculous lesion was demonstrated in the knee. This type of tuberculosis of the knee, unfortunately the commonest, therefore must be regarded as a dangerous disease. Among the fifty-five living patients four have evidence of active disease in the knee joint, which in each case is unsoundly ankylosed, one of them following excision. The remaining fifty-one patients show no sign of active disease; thirty-two have sound ankylosis following excision, seven following conservative treatment, five have unsound ankylosis, three have a good range of movement in the joint and in four amputation was necessary. In five of the seven extra-articular cases the lesion healed without involving the knee joint, three having a full range of movement and two about half the normal range. In the remaining two cases the disease spread to the joint, one resulting in ankylosis and the other, following spread to the spine and kidney, ending in death. The majority of the synovial cases were treated conservatively on a Thomas splint, and excision was considered only when the lesion progressed to a focal articular type. Even in the focal articular group conservative treatment was carried out first in order to increase local and general resistance before excision or until the patient was considered old enough for excision. Following excision, bony union may occur after several years. Excluding one synovial case in which amputation was necessary owing to an accident, amputation was performed eight times because of the local condition. Four of these patients died, and four are alive and well, with the exception of the one who is now being treated for tuberculosis of the spine. In the extra-articular type two patients were subjected to evacuation of the abscess cavity, and both have a full range of movement. Three cases healed without operation and without involving the joint. Operation, therefore, does not appear necessary unless roentgenograms show the lesion to be spreading toward the joint. In the one focal articular case in which the lesion appeared to be confined to the patella, the patella was excised. This patient still has an unsound ankylosis after twelve years but there is no evidence of active disease.

East African Medical Journal, Nairobi

17:49-88 (May) 1940

Nutrition and Agriculture. A. R. Paterson.—p. 51.
Recognition of Nutritional (Tropical) Macrocytic Anemia in Uganda and Its Previous Confusion with Malarial Splenomegaly and Splenic Anemia. H. C. Trowell.—p. 60.
Experiments on Destruction of Ticks. G. H. E. Hopkins and T. W. Chorley.—p. 71.

Lancet, London

2:1-30 (July 6) 1940

*Acute War Neuroses. W. Sargant and E. Slater.—p. 1.
*Treatment of Lobar Pneumonia and Bronchopneumonia. C. J. McSweeney.—p. 3.
Lupus Erythematosus: Toxic Effects of Sulfonamides. S. A. Propert.—p. 5.
Modification of Paul-Mikulicz Operation. S. Pringle.—p. 6.
The Rosenthal Anaerobic Method. A. A. Miles.—p. 7.
Surgical Treatment of Varicose Veins. H. Dodd and J. B. Oldham.—p. 8.
Hemolysis in Stored Blood Plasma: Simple Method for Its Estimation. R. Hudson.—p. 10.

Acute War Neuroses.—According to Sargant and Slater, cases of acute war neuroses, such as arose in the Flanders retreat, demonstrated that men of reasonably sound personality may break down if the strain is severe enough. This does not deny the importance of constitutional factors. Compared to an average population, this group of men would almost certainly show an excessive proportion who had suffered from nervous troubles in earlier life and an excessive frequency of psychiatric disorders in the blood relatives. Nevertheless these men had shown a satisfactory adaptation to army life and the previous history showed in most cases a man of normal intelligence, personality and work record. The stress required to produce a breakdown of such personalities was of an altogether different order from any to which they could expect to be subjected in ordinary life. It was an accumulation of strains, both physical and mental, of great intensity. The clinical picture was surprisingly uniform. There were the signs of physical exhaustion: thin, fallen-in face, pallid or sallow complexions. The expression and the whole attitude of the body was one either of tension and anxiety or of a listless apathy. Neurologic signs of a functional nature were usually present. A coarse irregular tremor of the hands was common. The resemblance to a parkinsonian picture was often increased by an immobile facies, and the superficial resemblance was so great that a number of cases had been diagnosed as parkinsonism. Reflexes were usually exaggerated, occasionally sluggish. Mentally the patients complained of the usual symptoms of the acute anxiety state: sleeplessness, terrifying bad dreams, a feeling of inner unrest and a tendency to be startled at the least noise but particularly at the sound of an airplane going overhead or any sound resembling it. The course taken by these patients under treatment was uniformly toward improvement. The change in appearance in the first few days with adequate sleep and rest and food was striking. Tremors rapidly diminished in intensity, as did also the general attitude of tension. The degree to which recovery is complete is more doubtful. It seems that these patients have gone through a process for which the term conditioning may be used. The first essential of treatment is to secure rest. This may be done in the milder cases by confinement to bed for a few days and the administration of an effective hypnotic. This must be combined with a full diet and ample fluids. The best method of securing the essential sleep varies in different patients. For some a quickly acting drug with an effect that lasts only a few hours may be all that is necessary. But the majority find difficulty not so much in getting to sleep as in remaining asleep. For these a drug with a longer effective action will be required. A considerable number of the more severely affected will require a course of continuous narcosis. It will get them through the worst period of their convalescence without their being aware of the severity of their symptoms, and it helps to minimize the process of conditioning. Any of the standard methods of narcosis may be employed. The Mira method, employed in the Spanish civil war, has been found disappointing in some cases, since the narcosis was not always complete. As a rule, continuous narcosis has not been given for much longer than a week. It was found desirable to relieve acute hysterical symptoms, including amnesias, at the earliest moment by persuasion under hypnosis, produced directly or with the aid of intravenous barbiturate.

Treatment of Pneumonia.—McSweeney compares the results of different methods of treatment in 478 unselected consecutive cases of lobar pneumonia treated in Cork Street Hospital. In the years from 1931 to 1933 a consecutive series of 120 cases were treated with daily intravenous injections of an 0.8 per cent suspension of a preparation containing iodine in combination with the colloidal and semicolloidal decomposition products of proteins (collosol iodine) until the crisis was reached. Of these, sixteen (13.3 per cent) died. In 172 cases antipneumococcus serum was used alone or in combination with the colloidal iodine. Death occurred in twenty-five (14.5 per cent) of these. In the 186 cases in which antipneumococcus serum was given together with sulfanilamide or, more often, with sulfapyridine, the mortality was 2.7 per cent. At present, antipneumococcus serum and sulfapyridine are used in lobar pneumonia at the author's hospital. The author presents results obtained with different methods of treatment in 171 unselected consecutive cases of bronchopneumonia admitted to the same hospital. With antipneumococcus serum alone the case mortality was 43.7; with antipneumococcus serum and sulfonamide (mostly sulfanilamide) 38 per cent in 1937 and 34 per cent in 1938, and with antipneumococcus serum and sulfapyridine 9.5 per cent. The great majority of the patients treated were children under 5, and the case mortality in this group was reduced from 50 per cent in 1936 and 1937 to 30 per cent in 1938 and to 10 per cent in 1939, the first complete "sulfapyridine" year.

Schweizerische medizinische Wochenschrift, Basel

70:617-640 (June 29) 1940. **Partial Index**

Lymph Stream in the Blood, Interstitial Clefts and Lymph Tracks. O. Müller.—p. 617.
*Oral Chemotherapy of Gonorrhea. G. Miescher.—p. 621.
Electrocardiographic Observations in Dissecting Aneurysm of Ascending Aorta. F. Wuhrmann.—p. 627.

Oral Chemotherapy of Gonorrhea.—Miescher reports on oral chemotherapy of 964 cases of gonorrhea. Of the substances used sulfathiazole and sulfapyridine gave the best results. The drugs were administered in decreasing doses within a period of six days, 18 Gm. in all. They appeared to be equally effective in new and old, simple and complicated cases. Vaccinotherapy and local treatment were also employed. The significance of the latter appeared to be small. The percentage of cures after a single treatment was 97 and 95 respectively, with men responding somewhat better to sulfathiazole and sulfapyridine. With the time required for observation and control by provocation, men were cured in from fourteen to sixteen and women in from twenty-five to forty days. The author points out the danger of intoxication and intolerance in the oral chemotherapy of gonorrhea. Of the drugs used sulfathiazole was tolerated best. It appeared to be the most effective and best tolerated antigonorrheal preparation.

Archivos de Pediatría del Uruguay, Montevideo

11:433-492 (May) 1940. **Partial Index**

Hydrolability in Infants. M. Laguarda.—p. 433.
*Treatment of Acute Purulent Pleurisy in Children. R. B. Yannicelli.—p. 460.

Treatment of Acute Purulent Pleurisy in Children.—Yannicelli reports satisfactory results from closed thoracic drainage in a group of twenty infants and children with acute purulent pleurisy. The majority of the patients were between the ages of 3 months and 5 years. The treatment consists of draining the pleural cavity through a number 16 Nelaton catheter which is introduced through the orifice of a trocar puncture. Drainage is practiced by repeated aspiration of pus with a syringe and the catheter is left in place, closed with a clamp and fastened to the chest wall for further aspirations. At the first aspiration only from 100 to 400 cc. should be removed. Further aspirations are made at convenient intervals and in amounts of not more than 20 cc. at each aspiration in order to prevent sudden intrapleural changes. When slow decompression is indicated and when the amount of fluid is scanty, the drainage is changed into a permanent one by attaching the distal portion of the catheter to a siphon tube, the distal portion of which is placed in a receptacle containing aqueous solution of sodium hypochlorite. The catheter is frequently clamped for a few minutes for temporary discontinuation of drainage. Lavages through the sound with aqueous solution of sodium hypochlorite are indicated when the pus is thick or fetid, in the presence of false membranes and in gangrenous pleurisy, except when a bronchopleural fistula is suspected. The treatment as a rule is effective in controlling acute purulent pleurisy in from two to five weeks. The catheter is removed one or two days after complete evacuation of pus. Before the drain is removed the condition is ascertained by x-ray examination. There were fifteen recoveries in the group of twenty cases reported by the author. Some of the deaths were caused by general sepsis rather than by the pleurisy. The author concludes that the treatment is simple, is well tolerated and causes neither shock nor sudden intrapleural decompression. Rib resection becomes unnecessary. In the few cases in which there exist indications for ample drainage, the closed thoracic drainage can be converted into a wide one.

Arch. Urug. de Med., Cir. y Especialid., Montevideo

16:301-392 (April) 1940. **Partial Index**

Gold Therapy in Rheumatic Fever: Indications and Technic. A. Ruiz Moreno.—p. 301.
*Clinical Diagnosis of Segmental Trunk Occlusion in Arteritis of Lower Limbs. E. C. Palma.—p. 340.

Clinical Diagnosis of Segmental Occlusion in Arteritis.—Palma found that segmental trunk occlusion of the lower limbs is a frequent complication in juvenile or senile arteritis. Arteriography is a reliable diagnostic method not commonly resorted to because it lacks simplicity. In the presence of typical arterial intermittent claudication, clinical diagnosis can be made from the following symptoms: (1) early disappearance of pulsation of the posterior tibial, dorsalis pedis and popliteal arteries in the presence of normal pulsation in the same arteries in the opposite limb, (2) diminution or disappearance of oscillometric oscillations in the middle or lower portion of the thigh of the involved limb in the presence of normal oscillations at the same points in the opposite limb and (3) pain or cramp in the calf of the involved limb on walking. Claudication may be of short or long duration, provided the disturbances of the peripheral circulation are slight. Pulsation of the femoral artery is determined by palpation in Scarpa's triangle. Popliteal pulsation is determined with the patient's limb in Buerger's position. These results may be further investigated by vasodilating tests such as the warm bath of Babinski and Heitz, induced hyperthermia and spinal and sympathetic lumbar anesthesia. The upper limit of occlusion is ascertained by the point of disappearance of arterial oscillations. The extent of the lesion is surmised from the acuteness of peripheral functional disorders, which are acute when the occlusion is low and several arteries are involved, and moderate when the occlusion is high and only one artery is involved. The author believes that clinical diagnosis based on the symptoms is important and may be relied on in many instances as an indication for operative intervention without recourse to arteriography.

Revista Med.-Quir. de Pat. Femenina, Buenos Aires

15:451-557 (June) 1940. **Partial Index**

*Thymus Rests in Exophthalmic Goiter. R. Finochietto and S. E. Luchetti.—p. 461.
Humoral Syndrome Complicating Surgery of Bile Ducts. R. S. Ferracani.—p. 504.

Thymus Rests in Exophthalmic Goiter.—Finochietto and Luchetti found, in the course of thyroidectomies, rests of the thymus microscopically verified in eight cases of exophthalmic goiter. The rests consisted of a cord of fibrous connective tissue or a lamina of fibrous and fatty tissue. The cord with or without nodules of thymic tissue was in continuity with one of the lower poles of the goiter and extended to the mediastinum behind the sternum. The lamina had their origin at the thyroid isthmus, covered the trachea and extended into the mediastinum. The authors found that these formations were not connected with real aberrent thymic gland but that they may be connected with intrathoracic goiter. These structures must be removed in the course of a thyroidectomy because they interfere with the removal of the lower pole of the goiter. Their course should be followed up to the point at which they disappear into the mediastinal tissues, in order to disclose the presence of an intrathoracic goiter, the persistence of which after an operation might give an erroneous interpretation of the results of the operation.

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*Considerations on Prognosis in Suppurative Coloproctitis. O. Moltke.—p. 121.

Prognosis in Suppurative Coloproctitis.—Moltke found hemoglobin values under 60 per cent in one fifth of the patients with suppurative coloproctitis who recovered and over 80 per cent in one third of the fatal cases and therefore considers the anemia in this disorder of doubtful significance as a prognostic sign. The relation between the cells with segmented nuclei and the immature neutrophil cells in the blood, however, seems to him an exceedingly important expression of the gravity of a case. He says that all the cases in his material with a shifting to the left of over 30 per cent were fatal, while only one patient with a shifting to the left of less than 30 per cent succumbed. Less marked shifting was seen in the moderately grave cases in which remission was possible, and normal values only in the mild cases. A low sedimentation rate may also be regarded as a favorable sign.